

Goal 2: Clean and Safe Water

STRATEGIC GOAL: Ensure drinking water is safe. Restore and maintain oceans, watersheds, and their aquatic ecosystems to protect human health, support economic and recreational activities, and provide healthy habitat for fish, plants, and wildlife.

BACKGROUND AND CONTEXT

Over the 30 years since enactment of the Clean Water and Safe Drinking Water Acts (CWA and SDWA), government, citizens, and the private sector have worked together to make dramatic progress in improving the quality of surface waters and drinking water.

Thirty years ago, much of the nation's tap water had either very limited treatment (usually disinfection) or no treatment at all. About two-thirds of the surface waters assessed by states were not attaining basic water quality goals and were considered polluted.¹ Some of the Nation's waters were open sewers posing health risks and many water bodies were so polluted that traditional uses, such as swimming, fishing, and recreation, were impossible.

Today, drinking water systems monitor and treat water to assure compliance with drinking water standards covering a wide range of contaminants. In addition, we now protect sources of drinking water through activities such as regulating injection of wastes to ground waters. A massive investment of federal, state, and local funds resulted in a new generation of wastewater treatment facilities able to provide "secondary" treatment or better. Over 50 categories of industry now comply with nationally consistent discharge regulations. In addition, sustained efforts to implement "best management practices" have helped reduce runoff of pollutants from diffuse or "nonpoint" sources.

Cleaner, safer water has renewed recreational, ecological, and economic interests in communities across the nation. The recreation, tourism, and travel industry is one of the largest employers in the nation, and a significant portion of recreational spending comes from swimming, boating, sport fishing, and hunting.² Each year, more

than 180 million people visit the shore for recreation.³ In 2001, sportspersons spent a total of \$70 billion—\$35.6 billion on fishing, \$20.6 billion on hunting, and \$13.8 million on items used for both hunting and fishing. Wildlife watchers spent an additional \$38.4 billion on their activities around the home and on trips away from home.⁴ The commercial fishing industry, which also requires clean water and healthy wetlands, contributed \$28.6 billion to the economy in 2001.⁵ The Cuyahoga River, which once caught fire, is now busy with boats and harbor businesses that generate substantial revenue for the City of Cleveland. The Willamette River in Oregon has been restored to provide swimming, fishing, and water sports. Even Lake Erie, once infamous for its dead fish, now supports a \$600 million per year fishing industry.⁶

Much of the dramatic progress in improving the nation's water quality over the past 30 years is directly attributable to our improvements in water infrastructure. Entering the 21st century, however, the job is far from over. Despite the gains made since the passage of the CWA and the SDWA, approximately 40% of the nation's waters assessed by states still do not meet basic water quality standards.⁷ Remaining water quality problems are not easily remedied: they come not just from discharge from pipes, but from diffuse sources — farming and forestry, construction sites, urban streets, automobiles, atmospheric deposition, even suburban homes and yards. They are no longer just chemical

¹ United States Environmental Protection Agency Office of Water. 1998. *Clean Water Action Plan: Restoring and Protecting America's Water*. Washington, DC: Government Printing Office.

² Travel Industry Association of America. *Tourism for America, 11th Edition*. Washington, DC: Travel Industry of America.

³ Pew Oceans Commission. 2002. *America's Living Oceans Charting a Course for Sea Change*. Arlington, VA: Pew Oceans Commission.

⁴ U.S. Fish and Wildlife Service. 2002. *2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation*. Washington, DC: Government Printing Office.

⁵ National Marine Fisheries Service. 2002. *Fisheries of the U.S. 2001*. Washington, DC: Government Printing Office.

⁶ United States Environmental Protection Agency Office of Water. 1998. *Clean Water Action Plan: Restoring and Protecting America's Water*. Washington, DC: Government Printing Office.

⁷ 303(d) information comes from: U.S. Environmental Protection Agency. *States' Listing of Impaired Waters as Required by Clean Water Act Section 303(d)*. Washington, DC. Available online at http://oaspub.epa.gov/waters/national_rept.control.

in nature. There are biological threats to our nation's waters that we must address as well if we are to truly achieve the stated goal of the CWA to "restore and maintain the chemical, physical, and biological integrity of the nation's waters."

States have identified more than 25,000 waterways as being impaired and have listed a group of principal causes of impairment to the waterways.⁸ One of these impairments is pesticides. The U.S. Geological Survey (USGS) has synthesized contaminant and nutrient data from its 1992-1998 National Water Quality Assessment (NAWQA) program. This assessment found that detectable concentrations of pesticides are widespread in urban, agricultural and mixed-use area streams. Interestingly, streams in urban areas generally have higher concentrations of insecticides than streams in agricultural areas, however incidences are generally lower. Recent trends toward low-density development (sprawl) will increase waterways' overall exposure to pesticides because it leaves fewer pristine natural areas and fewer trees and exposes more land to pesticides.

Reductions of pesticide concentrations in streams and groundwater require management strategies that focus on reducing chemical use. This means local and regional management strategies are needed to account for geographic patterns in chemical use and natural factors. One of the primary concerns for water quality in the U.S. is the role of small, dispersed sources of non-point source pollution. The major factors that contribute to the increasing levels of pesticides found in streams and groundwater include the application pattern of pesticides, the soil condition and the amount of rainfall or irrigation, which can increase pesticide run-off into streams and rivers.

Communities are challenged to find the fiscal resources to sustain the gains of the past 30 years, while providing clean and safe water for the future. They must find ways to replace aging infrastructure, to meet growing infrastructure demands fueled by population growth, and to secure their water and wastewater infrastructure against threats. To further our progress toward clean waters and safer drinking water, we must both maintain our commitment to the core measures we have already established and look for new ways to improve water quality and protect human health.

⁸ 303(d) information comes from: U.S. Environmental Protection Agency. *States' Listing of Impaired Waters as Required by Clean Water Act Section 303(d)*. Washington, DC. Available online at http://oaspub.epa.gov/waters/national_rept.control.

MEANS AND STRATEGY

EPA will focus on four key strategies to accelerate progress toward achieving the Nation's clean and safe water goals. To better address the complexity of the remaining water quality challenges, EPA will promote local watershed approaches to achieving the best and most cost effective solutions to local and regional water problems. To protect and build on the gains of the past, EPA will focus on its core water programs. To maximize the impact of each dollar, EPA will continue to strengthen our vital partnerships with States, Tribes, local governments, and other parties that are also working toward the common goal of improving the Nation's waters. To leverage progress through innovation, EPA will promote water quality trading, water efficiency, and other market based approaches.

To achieve the Nation's clean and safe water goals, EPA will operate under an overarching watershed approach in carrying out its statutory authorities under both the SDWA Amendments of 1996 and the CWA. EPA is committed to helping local governments meet the challenges of water management in the 21st century in fiscally responsible and sustainable ways. We want to maintain the improvements in water quality, while enabling communities to grow and prosper.

EPA's core water programs are the fundamental underpinning for protecting and building on the gains of the past. This approach calls for setting watershed goals, assessing conditions, determining sources of concern, addressing them using regulatory and voluntary tools, and then re-evaluating and adapting plans as new information becomes available. By focusing and integrating the work of EPA with sister agencies, States, Tribes, local governments, industry, and nonprofit organizations in watersheds, we are able to pool information, resources, and authorities and focus our collective energies on our common environmental objectives. In watersheds, we can better understand the cumulative impact of activities, determine the most critical problems, better allocate limited financial and human resources, engage stakeholders, win public support, and make real improvements in the environment.

Maintaining high environmental standards and sustaining a healthy economy requires that we work with States, Tribes, local governments, and other partners to optimize costs and conserve our natural resources. Innovative programs like water quality trading are based on a broad environmental perspective, looking at entire watersheds. Trading

can capitalize on economies of scale and control cost differentials among and between sources. Trading is a valuable tool to more cost-effectively implement TMDLs, and to enable communities to grow and prosper while maintaining their commitment to water quality. Trading can also be an appropriate mechanism in a pre-TMDL context.

As a result of mounting evidence that pesticide use can lead to contamination of groundwater, the Agency has developed a groundwater strategy. This strategy is designed to protect our groundwater resources from pesticide contamination. The Agency is working with the States and Tribes to implement local aspects of the strategy which includes providing assistance in the development of Pesticide Management Plans for both generic aspects of pesticide use, as well as more specific plans for a particular pesticide. The plans provide a roadmap to managing pesticides through preventive and corrective measures. In addition, EPA has an extensive scientific review process for data on new pesticides prior to granting registration, and on older pesticides under the reregistration program. One of the assessment areas for pesticides is the impact on ecosystems, including the likelihood of the chemical or product to leach into groundwater, or to persist in surface water after it leaves the field as runoff. Restrictions on use of the pesticide can be added to the registration (or reregistration), if warranted.

Research

EPA's water research program supports the Agency's Clean and Safe Water Goal by providing the scientific basis essential for protecting human health and the environment. Implementation of the research provisions in the 1996 Safe Drinking Water Act (SDWA) amendments and the Clean Water Act will provide improved tools (e.g., methods, models, risk assessments, management strategies, and new data) to better evaluate the risks posed by chemical and microbial contaminants that persist in the environment and threaten wildlife and, potentially, human health.

The drinking water research program will focus on filling key data gaps and developing analytical detection methods for measuring the occurrence of chemical and microbial contaminants on the Contaminant Candidate List (CCL) and developing and evaluating cost-effective treatment technologies for removing pathogens from water supplies while minimizing disinfection by-product (DBP) formation. The water quality research program will provide approaches and methods the Agency and its partners need to develop and apply

criteria to support designated uses, tools to diagnose and assess impairment in aquatic systems, and tools to restore and protect aquatic systems. Water quality research will address a wide spectrum of aquatic ecosystem stressors, with particular attention accorded to stressors that the Agency most often cites as causing water body impairment, including pathogens/indicators of fecal contamination, nutrients, and suspended and bedded sediments.

Several mechanisms are in place to ensure a high-quality water research program at EPA. EPA's Science Advisory Board (SAB), an independently chartered Federal Advisory Committee Act (FACA) committee, meets annually to conduct an in-depth review and analysis of EPA's Science and Technology account. The SAB provides its findings to the House Science Committee and sends a written report on the findings to EPA's Administrator after every annual review. EPA's Board of Scientific Counselors (BOSC) provides counsel to the Assistant Administrator for the Office of Research and Development (ORD) on the operation of ORD's research program. Also, under the Science to Achieve Results (STAR) program all research projects are selected for funding through a rigorous competitive external peer review process designed to ensure that only the highest quality efforts receive funding support. EPA's scientific and technical work products must also undergo either internal or external peer review, with major or significant products requiring external peer review. The Agency's Peer Review Handbook (2nd Edition) codifies procedures and guidance for conducting peer review.

STRATEGIC OBJECTIVES AND FY 2005 ANNUAL PERFORMANCE GOALS

Protect Human Health

- In 2005 93% of the population served by community water systems will receive drinking water that meets all applicable health-based drinking water standards through effective treatment and source water protection.
- In 2005 94% of the population served by community water systems will receive drinking water that meets health-based standards with which systems need to comply as of December 2001.
- In 2005 75% of the population served by community water systems will receive drinking water that meets health-based

standards with a compliance date of January 2002 or later.

- In 2005 94% of community water systems will provide drinking water that meets health-based standards with which systems need to comply as of December 2001.
- In 2005 75% of community water systems will provide drinking water that meets health-based standards with a compliance date of January 2002 or later.
- In 2005 90% of the population served by community water systems in Indian country will receive drinking water that meets all applicable health-based drinking water standards.
- In 2005 20% of source water areas for community water systems will achieve minimized risk to public health.
- In 2005 80% of the shellfish growing acres monitored by states are approved or conditionally approved for use.
- In 2005 At least 1% of the water miles/acres identified by states or tribes as having a fish consumption advisory in 2002 will have improved water and sediment quality so that increased consumption of fish and shellfish is allowed.
- In 2005 Coastal and Great Lakes beaches monitored by State beach safety programs will be open and safe for swimming in over 94% of the days of the beach season.
- In 2005 Restore water quality to allow swimming in not less than 2% of the stream miles and lake acres identified by states in 2000 as having water quality unsafe for swimming.

Protect Water Quality

- In 2005 500 of the Nation's watersheds have water quality standards met in at least 80% of the assessed water segments.
- In 2005 Water quality standards are fully attained in over 25% of miles/acres of waters by 2012, with an interim milestone of restoring 2% of these waters - identified in 2000 as not attaining standards - by 2005.

- In 2005 Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for: coastal wetlands loss by at least 0.1 point; contamination of sediments in coastal waters by at least 0.1 point; benthic quality by at least 0.1 point; & eutrophic condition by at least 0.1 point
- In 2005 Scores for overall aquatic system health of coastal waters nationally, and in each coastal region, is improved on the "good/fair/poor" scale of the National Coastal Condition Report by at least 0.1 point
- In 2005 In coordination with other federal partners reduce, by 11%, households on tribal lands lacking access to basic sanitation.
- In 2005 Water quality in Indian country will be improved at not less than 35 monitoring stations in tribal waters for which baseline data are available (i.e., show at least a 10% improvement for each of four key parameters: total nitrogen, total phosphorus, dissolved oxygen, and fecal coliforms.)

Enhance Science and Research

- In 2005 By 2005, provide methods for developing water quality criteria so that, by 2008, approaches and methods are available to States and Tribes for their use in developing and applying criteria for habitat alteration, nutrients, suspended and bedded sediments, pathogens and toxic chemicals that will support designated uses for aquatic ecosystems and increase the scientific basis for listing and delisting impaired water bodies under Section 303(d) of the Clean Water Act.

HIGHLIGHTS

Surface Water Protection

Water Quality Monitoring: EPA's fiscal year 2005 request will be the first step toward solving the well-documented shortcomings of the Nation's water quality monitoring. The most cost-efficient, practical means of making the most of scarce resources is information-based management that uses tools such as prevention, source water protection, watershed trading, and permitting on watershed basis. Monitoring is the foundation for information-based environmental management. It is imperative that we

close data and information gaps as quickly as possible: they lead to market and regulatory failures, thwart our ability to document progress, and limit our ability to effectively target limited resources. Without adequate monitoring data, the managers of water programs cannot inform the public about the condition of the Nation's waters; make wise management decisions; demonstrate the success or failure of those programs; and verify that resources are being used cost-effectively. Federal, State, and local monitoring data are essential for States to carry out their responsibilities for Clean Water Act requirements. Strengthening our monitoring program for both surface and ground water will allow for special emphasis on drinking water sources to support expeditious actions to protect or clean up these critical resources.

High quality, current monitoring data is critical for states and others to: make watershed-based decisions, target water quality criteria development, develop necessary standards and total maximum daily loads (TMDLs), and accurately and consistently portray conditions and trends. To support these efforts, the President's Budget proposes \$20 million to implement improved state monitoring efforts that will:

- Describe the condition of aquatic resources at multiple scales using scientifically defensible methods that are statistically valid and compatible;
- Apply predictive tools to target waters that need more intensive monitoring;
- Implement data management systems to facilitate exchange and use of data of documented quality;
- Determine site-specific water quality impacts, appropriate protection levels and cost-effective management actions;
- Monitor performance to determine effectiveness of management actions and support adaptive management, if needed; and
- Utilize monitoring councils/partnerships to improve collaboration among entities collection, analysis, and use of monitoring data and information.

This approach will result in social costs savings by maximizing the efficiency of monitoring and assessment resources and, more importantly, by ensuring that resources invested in environmental protection activities are directed most efficiently and are achieving performance objectives.

Concentrated Animal Feeding Operations and Storm Water: As evidenced by recent newspaper articles, withdrawal petitions, and the permit backlog,

some States are struggling with implementation of their NPDES permitting programs. In addition, the universe of facilities is increasing due to new program requirements to permit concentrated animal feeding operations (CAFOs) and additional sources of storm water. Without timely issuance of high quality permits, necessary improvements in water quality will be delayed. To help States with this workload, we are requesting an increase of \$5 million for Section 106 Grants. This increase would be used by States to support implementation of NPDES CAFO programs, which should result in pollutant reductions of over 2 billion pounds annually,⁹ and to support State issuance of storm water permits, resulting in long term annual reductions of approximately 100 billion pounds of sediment.¹⁰

Water Quality Trading: Water quality trading is a watershed approach based on voluntary partnerships at the local level. It capitalizes on economies of scale and control cost differences among sources, by allowing one source to meet its regulatory obligation by using pollutant reductions created by another source that has lower pollution control costs. Trading provides incentives for voluntary pollutant reductions, especially from sources that are not regulated. It encourages early reductions and more cost effective programs for restoring impaired waters. Trading also provides incentives for innovative solutions to complex and diverse water quality problems across the nation.

A current example of a successful trading effort between point sources can be found on Long Island Sound, where nitrogen trading among publicly owned treatment works in Connecticut is expected to save over \$200 million in control costs. A March 2003, report by the World Resources Institute, states that market mechanisms such as nutrient trading provide the greatest overall environmental benefits and a cost-effective strategy for reducing the Mississippi River Basin's contribution to the Dead Zone in the Gulf of Mexico. The report highlights

⁹ United States Environmental Protection Agency Office of Water. (January 2001). Development Document for the Proposed Revisions to the National Pollutant Discharge Elimination System Regulation and the Effluent Guidelines for Concentrated Animal Feeding Operations. (EPA-821-R-01-003). Washington, D.C. [On-line] Available: <http://epa.gov/waterscience/guide/>

¹⁰ U.S. EPA, Office of Water. "Economic Analysis of the Final Phase II Storm Water Rule," EPA 833-R-99-002, October 1999.

U.S. EPA, Office of Water. "Construction and Development Effluent Guideline Proposed Rule," *Federal Register* Notice (June 24, 2002). Accessed December 29, 2003. Available on the internet at: <http://www.epa.gov/waterscience/guide/construction/rule.html>

the fact that trading provides a real opportunity for farmers to play a role in reducing nutrient pollution.¹¹

In FY 2005, we plan to redirect \$4 million for this effort, to be set-aside within the Targeted Watershed Grants.

Water Efficiency: At the end of 2002, nearly half the continental U.S. was in drought.¹² In addition to reduced rainfall, most of our water systems also face a growing population and a growing economy. In the future, our waters are going to be even more stretched across competing demands. The Agency is committed to helping States and local governments address a multi-billion dollar gap between water and wastewater infrastructure needs and available capital financing over the next 20 years.

One way to reduce national water and wastewater infrastructure needs is by reducing water demand and wastewater flows, allowing for deferral or downsizing of capital projects. In addition to reduced infrastructure needs, less water demand may result in many environmental benefits including maintaining stream flows, protecting aquatic habitats, avoiding overdrawn aquifers, conserving sources of supply, and mitigating drought effects. In anticipation of these benefits, we are proposing to develop and implement a water efficiency market enhancement program that would promote recognition of water-efficient products based on the highly successful Energy Star Program. The Budget includes nearly \$1 million for this new program.

Surface Water Protection & Drinking Water Programs

Sustainable Infrastructure: Closing the infrastructure gap requires actions and innovations to reduce the demand for infrastructure, including better management, conservation (or smart water use), and intergovernmental cooperation through the watershed approach.

The touchstone of a long-term strategy to manage and maintain the Nation's infrastructure is fiscal sustainability. An important component of this strategy is promoting sustainable water and wastewater treatment systems. This includes ensuring the technical, financial, and managerial capacity of water and wastewater systems; helping

service providers avoid future gaps and expanding watershed approaches that engage stakeholders in broad-based action-oriented partnerships to identify efficient and effective local infrastructure solutions by adopting sustainable management systems to improve efficiency and economies of scale; and reducing the average cost of service. Through a \$2.5 million sustainable infrastructure initiative, we will work in partnership with States, the utility industry, and other stakeholders to enhance the operating efficiencies of water and wastewater systems. These efficiencies can help systems make the infrastructure investments needed to meet growing consumer demand, and help to sustain the human health and environmental gains we have achieved over the past three decades.

In FY 2005, the Agency will continue to coordinate with States and Tribes providing guidance and assistance in the development of generic and specific Pesticide Management Plans in order to protect our ground water resources. EPA will coordinate pesticide water issues and assist our partners in identifying and implementing effective ground water protection programs through these plans. The Agency will continue to support efforts on identifying the adverse effects of pesticides in ground and surface water at the State, Tribal and Regional levels. Additionally, we will continue to assist States and Tribes in identifying, developing and implementing measures to prevent or reduce water contamination. Key to this effort will be tailoring preventive and recovery measures to localities and specific pesticides.

Research

In FY 2005, EPA's drinking water research program will continue to conduct research to reduce the uncertainties of risk associated with exposure to microbial contaminants in drinking water and improve analytical methods to control risks posed by drinking water contamination. The drinking water research program will continue to focus on chemical and microbial contaminants on current and future CCLs. Significant data gaps still exist on the occurrence of harmful microbes in source and distribution system water, linkages between water exposure and infection, and the effectiveness of candidate treatment technologies to remove and inactivate these contaminants. Efforts will also continue to support arsenic-specific research and development of more cost-effective treatment technologies for the removal of arsenic from small community drinking water systems.

EPA is working to develop biological and landscape indicators of ecosystem condition, sources

¹¹ Greenhalgh, Suzie and Amanda Sauer. 2003. "Awakening the 'Dead Zone': An Investment for Agriculture, Water Quality, and Climate Change." World Resources Institute.

¹² The Drought Monitor; National Drought Mitigation Center; Website: www.drought.unl.edu/dm/about.html

of impairment, stressor response/fate and transport models, and options for managing stressors and their sources. Through the development of a framework for diagnosing adverse effects of chemical pollutants in surface waters, EPA will be able to evaluate the risks posed by chemicals that persist in the environment and accumulate in the food chain, threatening wildlife and potentially human health. The Agency will also develop and evaluate more cost-effective technologies and approaches for managing sediments, and evaluate management options for watershed restoration of TMDLs for other significant stressors (e.g., nutrients, pathogens and toxic compounds). Finally, research to address uncertainties associated with determining and reducing the risks to human health of the production and application of treated wastewater sludge (biosolids) to land for use as fertilizers and soil conditioners is emerging as an area of renewed importance for the Agency.

Another area of research will focus on growing evidence of the risk of infectious diseases resulting from exposure to microbes in recreational waters. Exposure to these diseases is of particular concern after major rainfall events that cause discharges from both point and non-point sources. These events may pose risks to human and ecological health through the uncontrolled release of pathogenic bacteria, protozoans, and viruses, as well as a number of potentially toxic, bioaccumulative contaminants. EPA will develop and validate effective watershed management strategies and tools for controlling wet weather flows (WWFs), which will enable EPA to provide states with consistent monitoring methods, standardized indicators of contamination, and standardized definitions of what constitutes a risk to public health.

EXTERNAL FACTORS

EPA's strategies for achieving clean and safe water depend on substantial contributions and investments by many public and private entities.

States are primary partners in implementation of both clean water and safe drinking water programs. Many states, however, are facing budget problems and even deficits. EPA recognizes that state budget shortfalls are an external factor that may limit progress toward clean and safe water goals.

Consistent with the federal government's unique trust responsibility to federally recognized tribes, EPA implements programs in Indian country, helps build tribal capacity to administer clean and safe water programs, and works with authorized tribes as co-regulators. Unlike states, many tribes are

still developing programs to administer clean and safe water programs.

Local governments play a critical role in implementing clean and safe water programs, and the continued participation of local government in these programs is critical to cleaner, safer water. Municipalities and other local entities have proven to be strong partners with states and the federal government in the financing of wastewater treatment and drinking water systems, and continued partnership in financing these systems is essential to meeting water goals. Municipalities are taking on additional responsibilities for addressing storm water and combined sewer overflows and they are adopting sustainable management practices to extend the useful lives of their wastewater infrastructure. Approximately 78 percent of wastewater treatment plants are operated by small communities, thousands of which have had past operational difficulties.¹³ Continued assistance to these small treatment plants, through the Wastewater Operator Training Program, is important to keeping the nation's waters clean. In the case of the drinking water program, effective local management of drinking water systems, including protection of source waters, is essential to maintaining high rates of compliance with drinking water standards. Ninety-five percent of the 160,000 or more public water systems responsible for meeting drinking water safety standards are small systems that face challenges in sustaining their capacity to provide safe drinking water.¹⁴ Strong partnerships with local governments are critical to achieving clean and safe water goals.

Several key components of the national water program, including nonpoint source control, source water protection, and watershed management, as well as the core water quality and drinking water standards, monitoring, TMDLs and NPDES permitting programs require broad partnerships among many federal, state, and local agencies. Over the next several years, building partnerships, particularly with the agricultural community (such as USDA, state agricultural agencies, and local conservation districts) is a top priority for meeting clean water goals. We must continue to provide EPA water quality data and work with USDA to help target runoff control programs' resources.

¹³ U.S. Environmental Protection Agency, Office of Enforcement and Compliance Assistance; Permit Compliance System; Web-site: www.epa.gov/oeca/planning/data/water/pcssys.html

¹⁴ U.S. Environmental Protection Agency Safe Drinking Water Information System (SDWIS/FED), <http://www.epa.gov/safewater/data/getdata.html>

States lead the effort in water quality monitoring. However, EPA relies on many other agencies to provide monitoring data to measure progress toward its goal of clean and safe water, such as the U.S Geological Survey, which maintains water monitoring stations throughout the nation, and NOAA, which provides information on coastal waters. EPA relies on the continued collection of data by these agencies.

Additionally, all of the EPA's coastal and oceans activities are carried out in partnership with other federal agencies, and, in some cases, international, state, local and private entities as well. EPA relies on its work with the Department of Defense, Coast Guard, Alaska and other states, and a number of cruise ship and environmental and non-governmental organizations regarding regulatory and non-regulatory approaches to managing wastewater discharges from vessels. Meeting ocean and coastal goals will also depend on the extent to which the growth in coastal areas is directed in ways that minimize effects on water quality.

West Nile Virus cases increased dramatically in 2002, spreading across 38 states and the District of Columbia. In areas with new West Nile virus detections, EPA regional offices have reported heightened concern about the pesticides used for mosquito control and the adverse affect it might have in contaminating groundwater. Pesticides are applied to areas where groundwater is prevalent due to the fact that mosquitoes need stagnant or standing water to lay their eggs. The possibility of the West Nile Virus expanding into new areas of the United States in the future will require the application of more pesticides onto the new breeding areas.

Resource Summary
(Dollars in thousands)

	FY 2003	FY 2004	FY 2005	FY 2005 Req. v.
	Actuals	Pres. Bud.	Pres. Bud.	FY 2004 Pres Bud
Clean and Safe Water	\$3,725,201.9	\$2,959,731.8	\$2,936,968.6	(\$22,763.3)
Protect Human Health	\$1,259,787.6	\$1,192,187.1	\$1,170,339.6	(\$21,847.5)
Protect Water Quality	\$2,346,144.8	\$1,647,043.1	\$1,645,669.9	(\$1,373.3)
Enhance Science and Research	\$119,269.5	\$120,501.6	\$120,959.1	\$457.5
Total Workyears	2,941.4	3,053.6	3,041.4	-12.3

OBJECTIVE: Protect Human Health

Protect human health by reducing exposure to contaminants in drinking water (including protecting source waters), in fish and shellfish, and in recreational waters.

Resource Summary (Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Protect Human Health	\$1,259,787.6	\$1,192,187.1	\$1,170,339.6	(\$21,847.5)
Environmental Program & Management	\$159,996.8	\$161,414.6	\$164,157..1	\$2,742.5
Science & Technology	\$18,362.0	\$27,926.9	\$6,709.8	(\$21,217.1)
Building & Facilities	\$1,361.4	\$1,480.2	\$1,595.3	\$115.1
State and Tribal Assistance Grants	\$1,085,448.9	\$1,008,640.4	\$1,004,412.2	(\$4,228.2)
Inspector General	\$6,871.9	\$7,701.4	\$7,594.4	(\$107.0)
Total Workyears	859.7	916.8	910.9	-5.8

Program Project
(Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Children and other Sensitive Populations	\$246.6	\$135.0	\$77.2	(\$57.8)
Categorical Grant: Public Water System Supervision (PWSS)	\$92,694.2	\$105,100.0	\$105,100.0	\$0.0
Categorical Grant: Underground Injection Control (UIC)	\$10,465.7	\$11,000.0	\$11,000.0	\$0.0
Categorical Grant: Pesticides Program Implementation	\$4,672.6	\$4,564.0	\$4,433.0	(\$131.0)
Categorical Grant: Beaches Protection	\$7,473.3	\$10,000.0	\$10,000.0	\$0.0
Beach / Fish Programs	\$3,197.3	\$3,689.5	\$3,237.6	(\$451.9)
Drinking Water Programs	\$86,119.7	\$99,085.5	\$100,947.6	\$1,862.1
Infrastructure Assistance: Drinking Water SRF	\$866,607.7	\$850,000.0	\$850,000.0	\$0.0
Infrastructure Assistance: Puerto Rico	\$0.0	\$8,000.0	\$4,000.0	(\$4,000.0)
Pesticides: Field Programs	\$2,001.2	\$2,510.8	\$2,482.7	(\$28.1)
Categorical Grant: Water Quality Cooperative Agreements	\$0.0	\$0.0	\$750.0	\$750.0
Congressionally Mandated Projects	\$111,719.6	\$0.0	\$0.0	\$0.0
International Capacity Building	\$3,419.4	\$1,611.2	\$2,181.0	\$569.8
Categorical Grant: Homeland Security	\$4,508.5	\$5,000.0	\$5,000.0	\$0.0
Homeland Security: Critical Infrastructure Protection	\$14,186.4	\$27,389.1	\$6,125.8	(\$21,263.3)
Administrative Projects	\$52,475.4	\$64,102.0	\$65,004.7	\$902.7
TOTAL	\$1,259,787.6	\$1,192,187.1	\$1,170,339.6	(\$21,847.5)

ANNUAL PERFORMANCE GOALS AND PERFORMANCE MEASURES**GOAL: CLEAN AND SAFE WATER****OBJECTIVE: PROTECT HUMAN HEALTH****Annual Performance Goals and Measures****Safe Drinking Water**

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| In 2005 | 93% of the population served by community water systems will receive drinking water that meets all applicable health-based drinking water standards through effective treatment and source water protection. |
| In 2005 | 94% of the population served by community water systems will receive drinking water that meets health-based standards with which systems need to comply as of December 2001. |
| In 2005 | 75% of the population served by community water systems will receive drinking water that meets health-based standards with a compliance date of January 2002 or later. |
| In 2005 | 94% of community water systems will provide drinking water that meets health-based standards with which systems need to comply as of December 2001. |
| In 2005 | 75% of community water systems will provide drinking water that meets health-based standards with a compliance date of January 2002 or later. |
| In 2005 | 90% of the population served by community water systems in Indian country will receive drinking water that meets all applicable health-based drinking water standards. |
| In 2004 | 85 percent of the population served by community water systems will receive drinking water meeting health-based standards promulgated in or after 1998. |
| In 2004 | 92% of the population served by community water systems will receive drinking water meeting all health-based standards in effect as of 1994, up from 83% in 1994. |
| In 2003 | End of year FY 2003 data will be available in 2004 to verify 85 percent of the population served by community water systems received drinking water meeting health-based standards promulgated in or after 1998. |
| In 2003 | End of year FY 2003 data will be available in 2004 to verify 92% of the population served by community water systems received drinking water meeting all health-based standards in effect as of 1994, up from 83% in 1994. |

Performance Measures:

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Percent of population served by community drinking water systems with no violations during the year of any Federally enforceable health-based standards that were in place by 1994.	91	92		% Population
Population served by community water systems providing drinking water meeting health-based standards promulgated in or after 1998.	96	85		% Population
Population served by community water systems that receive drinking water that meets health-based standards with which systems need to comply as of December 2001			94	% Population
Population served by community water systems that receive drinking water that meets health-based standards with a compliance date of January 2002 or later			75	% Population
Percentage of community water systems that provide drinking water that meets health-based standards with which systems need to comply as of December 2001			94	% CWSs
Percentage of community water systems that provide drinking water that meets health-based standards with a compliance date of January 2002 or later			75	% CWSs
Percent of the population served by community water systems in Indian country that receive drinking water that meets all applicable health-based drinking water standards			90	% Population
% of population served by community water systems that receive drinking water that meets all applicable health-based drinking water standards through effective treatment and source water protection			93	% population

Baseline: In 1998, 85% of the population that was served by community water systems and 96% of the population served by non-community, non-transient drinking water systems received drinking water for which no violations of Federally enforceable health standards had occurred during the year. Year-to-year performance is expected to change as new standards take effect. Covered standards include: Stage 1 disinfection by-products/interim enhanced surface water treatment rule/long-term enhanced surface water treatment rule/arsenic.

Source Water Protection

In 2005	20% of source water areas for community water systems will achieve minimized risk to public health.
In 2004	Advance States' efforts with community water systems to protect their surface and ground water resources that are sources of drinking water supplies.
In 2003	End of year FY 2003 data will be available in 2004 to verify 39,000 community water systems (75% of the nation's service population) will have completed source water assessments and 2,600 of these (10% of the nation's service population) will be implementing source water protection programs.

Performance Measures:

Number of community water systems and percent of population served by those CWSs that are implementing source water protection programs.

**FY 2003
Actuals**
Data Lag

**FY 2004
Pres. Bud.**
25% / 7,500

**FY 2005
Pres. Bud.**

% pop/systems

Percent of source water areas for community water systems that achieve minimized risk to public health

20

% Areas

Baseline: EPA defines "achieve minimized risk" as substantial implementation of source water protection actions, as determined by a State's source water protection strategy. Approximately 268 million people are estimated to be served by Community Water Systems (CWSs) in 2002.

River/Lake Assessments for Fish Consumption

In 2005 80% of the shellfish growing acres monitored by states are approved or conditionally approved for use.

In 2005 At least 1% of the water miles/acres identified by states or tribes as having a fish consumption advisory in 2002 will have improved water and sediment quality so that increased consumption of fish and shellfish is allowed.

In 2004 Reduce consumption of contaminated fish by increasing the information available to States, Tribes, local governments, citizens, and decision-makers.

In 2003 Reduced consumption of contaminated fish by increasing the information available to States, Tribes, local governments, citizens, and decision-makers.

Performance Measures:

Lake acres assessed for the need for fish advisories and compilation of state-issued fish consumption advisory methodologies. (cumulative)

**FY 2003
Actuals**
33

**FY 2004
Pres. Bud.**
35

**FY 2005
Pres. Bud.**

% Lake acres

River miles assessed for the need for fish consumption advisories & compilation of state-issued fish consumption advisory methodologies. (cumulative)

15

16%

% River miles

Percent of water miles/acres, identified by states or tribes as having fish consumption advisories in 2002, where increased consumption of fish is allowed.

1

% Miles/Acres

Percent of the shellfish growing acres monitored by states that are approved or conditionally approved for use

80

% Areas

Baseline: In 1999, 7% of the Nation's rivers and 15% of the Nation's lakes were assessed to determine if they contained fish that should not be eaten or should be eaten in only limited quantities. In September 1999, 25 states/tribes are monitoring and conducting assessments based on the national guidance to establish nationally consistent fish advisories. In the 2000 Report to Congress on the National Water Quality Inventory, 69% of assessed river and stream miles; 63% of assessed lake, reservoir, and pond

acres; and 53% of assessed estuarine square miles supported their designated use for fish consumption. For shell fish consumption, 77% of assessed estuary square miles met this designated use.

Increase Information on Beaches

- In 2005 Coastal and Great Lakes beaches monitored by State beach safety programs will be open and safe for swimming in over 94% of the days of the beach season.
- In 2005 Restore water quality to allow swimming in not less than 2% of the stream miles and lake acres identified by states in 2000 as having water quality unsafe for swimming.
- In 2004 Reduce human exposure to contaminated recreation waters by increasing the information available to the public and decision-makers.
- In 2003 Reduced human exposure to contaminated recreation waters by increasing the information available to the public and decision-makers.

Performance Measures:

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Beaches for which monitoring and closure data is available to the public at http://www.epa.gov/waterscience/beaches/ . (cumulative)	2,823	2,823		Beaches
Restore water quality to allow swimming in stream miles and lake acres identified by states			2	% Miles/Acres
Days (of beach season) that coastal and Great Lakes beaches monitored by State beach safety programs are open and safe for swimming.			94	% Days/Season

Baseline: By the end of FY 1999, 33 states had responded to EPA's first annual survey on state and local beach monitoring and closure practices and EPA made available to the public via the internet. An average of 9 recreational contact waterborne disease outbreaks reported per year by the Centers for Disease Control for the years 1994-1998, based on data housed in EPA/ORD internal database. In 2002, monitored beaches were opened 94% of the days during the beach season.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measures: The percentage of the population served by community water systems that receive drinking water that meets health-based standards with which systems need to comply as of December 2001.

The percentage of the population served by community water systems that receive drinking water that meets health-based standards with a compliance date of January 2002 or later. (Covered standards include: Stage I disinfection by-products/interim enhanced surface water treatment rule/long-term enhanced surface water treatment rule/arsenic.)

The percentage of community water systems that provide drinking water that meets health-based standards with which systems need to comply as of December 2001.

The percentage of community water systems that provide drinking water that meets health-based standards with a compliance date of January 2002 or later.

The percentage of population served by community water systems in Indian country that receive drinking water that meets all applicable health-based drinking water standards.

Performance Database: Safe Drinking Water Information System- Federal Version (SDWIS or SDWIS-FED). SDWIS contains basic inventory information, including an individual public water system's activity status, type of water system (i.e., community, non-community, and non-transient non-community), and the population served by that system. SDWIS also contains violations records that detail violations of the Safe Drinking Water Act and the statute's implementing regulations. The performance measure is based on the population served by community water systems that were active during any part of the performance year and did not have any violations designated as "health based." Exceedances of a maximum contaminant level and violations of a treatment technique are health-based violations; monitoring and reporting, record keeping, and public notification violations are not "health based."

Data Source: Agencies with primacy (primary enforcement authority) for the Public Water Supply Supervision (PWSS) program including states and EPA Regional Offices with direct implementation (DI) responsibility for states and Indian tribes. The Navajo Nation Indian tribe, the only tribe with primacy, is expected to begin reporting directly to EPA in FY 2004. Primacy agencies collect the data from the regulated water systems, determine compliance, and report a subset of the data to EPA (primarily inventory and violations).

Methods, Assumptions and Suitability: The analytical methods that drinking water systems use to collect violations data are specified in the technical guidance associated with each drinking water regulation. Laboratories must be certified by the primacy agencies to analyze drinking water samples and are subject to periodic performance audits by the states and EPA as the direct implementers. Performance measures are based on data reported by individual systems to states, which, in turn, supply the information to EPA through SDWIS. EPA then verifies and validates the data for 10 to 12 states per year, according to a protocol, which is updated annually. To measure program performance, EPA aggregates the SDWIS data into a national statistic on overall compliance with health-based drinking water standards. This statistic compares the total population served by community water systems meeting all health-based standards to the total population served by all community water systems.

QA/QC Procedures: SDWIS-FED has numerous edit checks built into the software to reject erroneous data. There are quality assurance manuals for states and Regions to follow to ensure data quality. The manuals provide standard operating procedures for conducting routine assessments of the quality of the data, communication and follow-up actions to be conducted with the state to achieve timely corrective action(s). EPA offers training to states on reporting requirements, data entry, data retrieval, and error correction. User and system documentation is produced with each software release and is maintained on EPA's web site. SDWIS-FED documentation includes data entry instructions, data element dictionary (on-line data dictionary - electronic documentation), entity relationship diagrams, a user's manual, and regulation-specific reporting requirements documents. System, user, and reporting requirements documents can be found on the EPA web site, <http://www.epa.gov/safewater/>. System and user documents are accessed via the database link <http://www.epa.gov/safewater/databases.html>, and specific rule reporting requirements documents are accessed via the regulations, guidance, and policy documents link <http://www.epa.gov/safewater/regs.html>. In addition, EPA provides specific error correction and reconciliation support through a troubleshooter's guide, a system-generated summary with detailed reports documenting the results of each data submission, and an error code database for states to use when they have questions on how to enter or correct data. A user support hotline is available 5 days a week to answer questions and provide technical assistance. At least one EPA staff person in each EPA regional office serves as the SDWIS-FED Regional data management coordinator to provide technical assistance and training to the states on all aspects of information management and required reporting to EPA. Primacy agencies' information systems are audited on an average schedule of once every 3 years.

SDWIS-FED does not have a quality assurance project plan - it is a legacy system which has “evolved” since the early 1980s prior to the requirement for a plan. The SDWIS-FED equivalent is the data reliability action plan¹⁵ (DRAP). The DRAP contains the processes and procedures and major activities to be employed and undertaken for assuring the data in SDWIS meet required data quality standards. There are three major components of this plan: assurance, assessment, and control. The assurance component includes management of the plan, development and/or maintenance of tools used to support the implementation processes and procedures, and standard operating procedures. It also includes provision of training, technical assistance vehicles, coordination with other program areas that use the data or impact its quality. The second major component of the plan is assessment. Quality assurance assessments include all types of review, audit, and assessment of the DRAP, data, and information needs. The third major component of the plan is control. Quality assurance controls include software edit checks, processing controls, security controls, and other procedural controls that limit or prevent incomplete, inaccurate, or unauthorized updates or modifications to the data. The data verification protocol, and its use in on-site audits of states’ files, is the final measure of data quality control. Thirty-one state data verification audits were conducted over the period from 1999 to 2001.

Data Quality Review: SDWIS data quality was identified as an Agency weakness in 1999 and has a corrective action completion target date in 2005. SDWIS’ weaknesses center around five major issues: 1) completeness of the data (e.g., the inventory of public water systems, violations of maximum contaminant levels, enforcement actions) submitted by the states, 2) timeliness of the data sent by the states, i.e., if states do not report at specified times, then enforcement and oversight actions suffer, 3) difficulty receiving data from the states, 4) both cost and difficulty processing and storing data in SDWIS after it has been received, and 5) difficulty getting SDWIS data for reporting and analysis. The DRAP focuses on the first three issues, and an information strategic plan¹⁶ (ISP) has been developed and is being implemented to address the last two issues, which deal primarily with technology (hardware and software) concerns. For instance, the ISP is examining ways to improve tools and processes for creating and transferring data to EPA, such as incorporating newer technologies and adapting the Agency’s Enterprise Architecture Plan to integrate data and the flow of data from reporting entities to EPA via a secure central data exchange (CDX) environment. Detailed activities and implementation schedules are included in these two documents, and to date the Agency expects to correct these weaknesses by the end of 2005.

Routine data quality assurance and quality control (QA/QC) analyses of the Safe Drinking Water Information System (SDWIS) by the Office Water (OW) have revealed a degree of nonreporting of violations of health-based drinking water standards, and of violations of regulatory monitoring and reporting requirements. As a result of these data quality problems, the baseline statistic of national compliance with health-based drinking water standards likely is lower than previously reported. The Agency is currently engaged in a rigorous statistical analysis and in discussions with states to more accurately quantify the impact of these data quality problems on the estimate of national compliance with health-based drinking water standards. This analysis could result in statistically based adjustments to the baseline that will lower the 5-year (2008) performance targets for our SDWIS-based subobjective and strategic measures. Ongoing EPA and state efforts to improve data quality in SDWIS already have resulted in significant improvements in data accuracy and completeness, however. Even as these improvements are made, SDWIS serves as the best source of national information on compliance with Safe Drinking Water Act requirements, and is a critical database for program management, the development of drinking water regulations, trends analyses, and public information.

Management System Reviews (MSRs) of quality assurance/quality control (QA/QC) systems for SDWIS are carried out by the Quality Assurance Division of the Office of Environmental Information. An MSR of SDWIS data quality was completed in 1999 and the final report contained favorable comments on the level of detail in EPA’s plans and actions to improve data quality. EPA also completed a data reliability assessment (QA audit) of the 1996–1998 SDWIS-FED data in FY 2000, which, in turn, led to the development and issuance of the 2002 DRAP. A second data reliability assessment is expected to be released in January 2004 and is based on 1998–2001 data in SDWIS/FED. Also, the 2002 DRAP will be revised and expanded in 2004 to include the findings of the second data reliability assessment.

¹⁵ *Data Reliability Action Plan*. U.S. EPA, October 2002. Office of Ground Water and Drinking Water internal work plan document.

¹⁶ U.S. EPA, Office of Water, *Office of Ground Water and Drinking Water Information Strategy* (under revision). See *Options for OGWDW Information Strategy (Working Draft)*, EPA 816-P-01-001. Washington, DC, February 2001. Available on the Internet at <http://www.epa.gov/safewater/data/informationstrategy.html>

- The basic findings from the second data reliability assessment were that the data in SDWIS are accurate but incomplete. Improvements were observed in all areas except timeliness of violations reporting. Core inventory data are highly complete and accurate. The quality of violations data is improving, with high accuracy but still low in completeness. Monitoring and reporting violations continue to be the major problem area. Health-based violation data quality is highly accurate with higher levels of completeness than monitoring violations data.

Finally, EPA and its contracted auditors of primacy agencies' information systems conduct individual data quality reviews. The frequency of these audits is every 2 to 4 years depending on the resources available and programmatic need in the region. Continuous data quality reviews include data quality estimates based on the results of data verifications, timeliness and completeness of violation reporting, completeness of various required inventory data elements, and completeness of reporting for specific rules.

Data Limitations: Currently SDWIS-FED is an "exceptions" database that focuses exclusively on public water systems noncompliance with drinking water regulations (health-based and program). Primacy states implement drinking water regulations with the support of the Public Water System Supervision (PWSS) grant program and determine whether public water systems have violated: maximum contaminant levels (MCL); treatment technique requirements; consumer notification requirements; or monitoring-and-reporting requirements. These violations are reported through SDWIS.

Recent state data verification and other quality assurance analyses indicate that the most significant data quality problem is under-reporting to EPA of monitoring and health-based standards violations and inventory characteristics, such as water sources and/or latitude/longitude for all sources. The most significant under-reporting occurs in monitoring violations. Even though those are not covered in the health based violation category, which is covered by the performance measure, failures to monitor could mask treatment technique and MCL violations. Such under-reporting of violations limits EPA's ability to: 1) accurately quantify the number of sources and treatments applied, 2) undertake geo-spatial analysis, and 3) integrate and share data with other data systems. The under-reporting limits EPA's ability to precisely quantify the population served by systems, which are meeting the health-based standards. As described in the Data Quality Review section above, currently the program office is assessing the percentage of unreported health-based violations and calculating possible adjustments to the performance data that might be required for future reports. The SDWIS inventory of public water systems is highly complete and the quality of population data has been determined to be of high quality.

In addition to the DRAP and the information strategy, other options under consideration to improve data in SDWIS include:

1. Increase the focus on state compliance determinations and reporting of complete, accurate and timely violations data. This is the single most significant factor for data quality improvement.
2. Develop incentives to improve the accuracy, completeness, and timeliness of state reporting.
3. Enhance and ease the flow of data from providers to EPA via a secure environment (Central Data Exchange - CDX), utilizing modern technologies (e.g., extensible markup language - XML) and standardized procedures and processes.
4. Continue to analyze the quality of the data.
5. Obtain parametric data (analytical results used to evaluate compliance with monitoring regulations and compliance with treatment techniques and maximum contaminant levels) from states through an agreement on voluntarily reporting these data to EPA, monitoring schedules, and waiver information assigned to water systems by the state primacy agency. This information would allow EPA to have more direct access to the data used for compliance determinations for quality assurance and state oversight purposes. Potential violation under reporting could be identified through the availability of this information and appropriate corrective actions implemented.

Error Estimate: Analyses are under way to determine the impact of data quality on the performance measures, and are scheduled for completion by early 2004. The analysis will include data from an additional round of audits to provide a more accurate error estimate compared to the results of earlier baseline audits.

New/Improved Data or Systems: Several approaches are underway.

First, EPA will continue to work with states to implement the DRAP and ISP, which have already improved the completeness, accuracy, timeliness, and consistency of the data in SDWIS-FED through: 1) training courses for SDWIS-FED data entry, error correction, and regulation specific compliance determination and reporting requirements, 2) specific DRAP analyses, follow-up activities and state-specific technical assistance, 3) increased number of data verifications

conducted each year, and 4) creation of various quality assurance reports to assist regions and states in the identification and reconciliation of missing, incomplete, or conflicting data.

Second, more states will use SDWIS-STATE,¹⁷ a software information system jointly designed by states and EPA, to support states as they implement the drinking water program. SDWIS-STATE is the counterpart to SDWIS-FED and uses many of the same edit criteria and enforces many of the mandatory data elements. If the SDWIS-STATE system is fully utilized by a state, the information it holds would meet EPA's minimum data requirements. SDWIS-STATE links directly to SDWIS-FED, which aids in easing the states' reporting burden to EPA and in the process minimizes data conversion errors and improves data quality and accuracy. In addition, a Web-enabled version of SDWIS-STATE and a data migration application that can be used by all states to process data for upload to SDWIS-FED are being developed. EPA estimates that 40 states will be using SDWIS-STATE for data collections by the end of FY 2004.

Third, EPA is modifying SDWIS-FED to (1) streamline its table structure, which simplifies updates and retrievals, (2) minimize data entry options that result in complex software and prevent meaningful edit criteria, (3) enforce compliance with permitted values and Agency data standards through software edits, and (4) ease the flow of data to EPA through a secure data exchange environment incorporating modern technologies, all of which will improve the accuracy of the data.

Fourth, EPA has developed a data warehouse system that is optimized for analysis, data retrieval, and data integration from other data sources like information from data verifications, sample (parametric) data, source water quality data (e.g., U.S. Geological Survey [USGS] data), and indicators from inspections conducted at the water systems. It will improve the program's ability to more efficiently use information to support decision-making and effectively manage the program.

Finally, EPA, in partnership with the states, is developing information modules on other drinking water programs: the Source Water Protection Program, the Underground Injection Control Program (UIC), and the Drinking Water State Revolving Fund. These modules will be integrated with SDWIS to provide a more comprehensive data set with which to assess the nation's drinking water supplies, a key component of the goal. In 2003, agreement was reached on the data elements for reporting source water and UIC data. In 2004, plans will be developed for design of systems to address these data flows. Developing the systems to receive the data is scheduled for 2005.

References:Plans*

- SDWIS-FED does not have a Quality Assurance Project Plan - it is a legacy system which has "evolved" since the early 80s prior to the requirement for a Plan. The SDWIS-FED equivalent is the Data Reliability Action Plan.
- Information Strategy Plan - SDWIS-FED (see footnote 2)
- Office of Water Quality Management Plan, available at <http://www.epa.gov/water/info.html>
- Enterprise Architecture Plan

¹⁷ SDWIS/STATE (Version 8.1) is an optional Oracle data base application available for use by states and EPA regions to support implementation of their drinking water programs.

U.S. EPA, Office of Ground Water and Drinking Water. Data and Databases. Drinking Water Data & Databases – SDWIS/STATE, July 2002. Information available on the Internet: <http://www.epa.gov/safewater/sdwis_st/current.html>

Reports*

- 1999 SDWIS/FED Data Reliability
- 2003 SDWIS/FED Data Reliability Report - contains the Data Reliability Action Plan and status report
- PWSS Management Report (quarterly)
- 1999 Management Plan Review Report
- 2003 Management Plan Review Report

Guidance Manuals, and Tools

- PWSS SDWIS/FED Quality Assurance Manual
- Various SDWIS-FED User and System Guidance Manuals (includes data entry instructions, data On-line Data Element Dictionary-a database application, Error Code Data Base (ECDB) - a database application, users guide, release notes, etc.) Available on the Internet at <http://www.epa.gov/safewater/sdwisfed/sdwis.htm>
- Regulation-Specific Reporting Requirements Guidance. Available on the Internet at <http://www.epa.gov/safewater/regs.html>

Web site addresses

- OGWDW Internet Site <http://www.epa.gov/safewater/databases.html> and contains access to the information systems and various guidance, manuals, tools, and reports.
- Sites of particular interest are:
<http://www.epa.gov/safewater/data/getdata.html> contains information for users to better analyze the data, and
<http://www.epa.gov/safewater/sdwisfed/sdwis.htm> contains reporting guidance, system and user documentation and reporting tools for the SDWIS-FED system.

FY 2005 Performance Measure: Percentage of source water areas for community water systems that achieve minimized risk to public health.

Performance Database: The source water assessment and protection programs are authorized under Sections 1453, 1428, and relevant subsections of 1452 of the Safe Drinking Water Act (SDWA).¹⁸ EPA issued guidance to implement these programs in 1997, *State Source Water Assessment and Protection Programs Guidance*.¹⁹ EPA will issue supplemental reporting guidance - - *Source Water Assessment and Protection Measures: Initial Guidance* - - in 2004. Starting in FY 2003, and updated annually thereafter, states will report to EPA on the results of their source water assessment programs' (SWAPs) progress in implementing source water protection (SWP) strategies, and whether such strategy implementation is affecting public health protection. To assess *progress in completing the SWAPs*, state reporting will include five elements: (1) the delineated source water areas around each well and intake, (2) whether the assessments are complete, (3) and (4) most prevalent and most threatening sources of contamination, and (5) relative susceptibility ratings across source water areas, i.e., high, medium, or low susceptibility. To assess *progress in implementing the SWP strategies*, state reporting will include three elements: (1) whether a prevention strategy covering source water areas has been adopted, (2) whether that strategy is being implemented, and (3) whether such strategy implementation has reached a substantial level. To assess *whether the program is affecting public health protection*, states will report change in the number of source water areas with substantially

* These are internal documents maintained by EPA's Office of Ground Water and Drinking Water. Please call 202-564-3751 for further information.

¹⁸ *Safe Drinking Water Act Amendments of 1996*. P.L. 104-182. (Washington: 6 August 1996). Available on the Internet at <http://www.epa.gov/safewater/sdwa/sdwa.html>

¹⁹ U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <http://www.epa.gov/safewater/swp/swappg.html>

implemented source water protection strategies. The Agency will develop a national summary of data on the progress of states' source water protection programs using these data elements.

In FY 2003, EPA maintained state-level summary data for each of these elements in an Excel database. Beginning in FY 2004, states may, at their option, make available to EPA public water system-level data for each of these elements to be maintained in a set of data tables in the drinking water warehouse (for tabular data) and in event tables in the Office of Water's Reach Address Database (RAD)²⁰ (GIS data). These data will be compatible with the inventory data States are currently reporting to the Safe Drinking Water Information System (SDWIS).²¹ [Not publicly available. Contact the Drinking Water Protection Division at 202-564-3797.]

Data Source: See section "New/Improved Data or Systems."

Methods, Assumptions and Suitability: For this measure, the states' reporting of progress in implementing their source water assessment and protection programs will be based on EPA's 2004 guidance, *Source Water Assessment and Protection Measures: Initial Guidance*. States will only report state-level summary information that may be: (1) directly related to specific community water systems in a database; (2) directly related to the community water systems sampled in a statewide statistical sample; or (3) estimated using best professional judgment. Because state reporting will be based on consistent definitions and procedures found in the *Source Water Assessment and Protection Measures: Initial Guidance*, EPA assumes that these data are reliable for use in making management decisions.

QA/QC Procedures: QA/QC procedures will be included in the 2004 *Source Water Assessment and Protection Measures: Initial Guidance*. Additionally, a series of data checks will be built into the Excel-based data collection procedures given to each Region for their work with states. States will be required to identify whether their reported summary-level data are based on a system-level database or on aggregate-level estimates. EPA's Regions also will work with individual states to obtain a description of their methods of collecting and verifying information.

Data Quality Reviews: EPA Regions will conduct data quality reviews of state data using the QA/QC procedures included with the Excel-based data system, and work with states to resolve data exceptions. As a result, EPA expects the quality of data on assessments and source water protection activities to improve over time.

Data Limitations: Because the initial reporting provides only state-level summary information, there is no standard protocol for EPA to verify and validate the data to system-level information contained in state databases. In addition, much of the data reported by states is voluntary and based on working agreements with EPA because SDWA only requires states to complete source water assessments. The only source water information that states are required to report to EPA under SDWA is whether the assessments are completed. Although EPA's 2004 *Source Water Assessment and Protection Measures: Initial Guidance* will set standard data definitions and procedures, it also provides for considerable flexibility in states' data collection protocols and analytical methods to evaluate their data. For example, some states may require each public water system (PWS) to report data, while others may institute a voluntary process. Further, those states that use statistical surveys may choose samples differently. Because much of the data reporting is voluntary and the individual state protocols may vary, state data may be incomplete and inconsistent across states.

Error Estimate: There is no basis for making an error estimate for this performance measure given the data limitations of state-level summary reporting described above.

New/Improved Data or Systems: EPA is developing a new source water data module to collect, store, and use public water system-level data received from states. The source water module is being developed as a joint initiative between EPA, the Association of State Drinking Water Administrators (ASDWA), and the Ground Water Protection Council (GWPC). It will give EPA the ability to access the data directly from states through a data exchange agreement using an electronic data transfer capability. A state may choose, at its option, to provide EPA more detailed data in lieu of state-level summary reporting. The new source water data module will be integrated into the

²⁰ Watershed Assessment, Tracking & Environmental Results (WATERS). Available only on the Internet at <http://www.epa.gov/waters/>

²¹ Safe Drinking Water Information System (SDWIS). Information available on the Internet at <http://www.epa.gov/safewater/databases.html>

drinking water data warehouse and be compatible with Safe Drinking Water Information System (SDWIS) data already reported by states. Geospatial data (i.e., the intake and well point locations and the source water area polygons) will be maintained in EPA's Office of Water's Reach Access Database (RAD). The source water assessment and protection indicator data and other attribute data will be maintained in data tables in the drinking water warehouse. The source water data module should be operational in FY 2004. A number of states are expected to report this detailed data in 2004 as part of the EPA/ASDWA/GWPC initiative.

References:

Guidance Manuals

- U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <http://www.epa.gov/safewater/swp/swappg.html>
- *Source Water Assessment and Protection Measures: Initial Guidance* (to be released late summer 2003)

Web site addresses

- US EPA Office of Ground Water and Drinking Water. <http://www.epa.gov/safewater>
- For more detailed information on Source Water topics, US EPA Office of Ground Water and Drinking Water, Source Water site. <http://www.epa.gov/safewater/protect.html>
- US EPA Office of Water (OW) Reach Access Database (RAD). Watershed Assessment, Tracking & Environmental Results (WATERS). <http://www.epa.gov/waters/>
- Safe Drinking Water Information System (SDWIS). <http://www.epa.gov/safewater/databases.html>

FY 2005 Performance Measure: Percent of the population and the number of community water systems - - serving more than 3,300 but less than 50,000 people - - that have certified the completion of the development or revision of their emergency response plan.

Performance Database: No formal EPA database. Performance is tracked against a master list of small systems (each of which serves between 3,301 and 49,999 people) that has been compiled specifically for this performance measure.

Data Source: The Safe Drinking Water Information System (SDWIS) is the source of drinking water system descriptive information, including system size. The master list of small drinking water systems was compiled by determining which systems, based on size, are required to develop/revise emergency response plans and submit a certification of completion of this activity to EPA in accordance with the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act).

Methods, Assumptions and Suitability: The method for determining the number of small community water systems subject to the requirements of the Bioterrorism Act was to compile the number of community water systems listed in SDWIS in July 2002. This listing was sent to Regional drinking water program staff who, in turn, worked with each state in that Region to review and categorize these systems by size as defined in the Bioterrorism Act. However, because the number of community water systems changes often - - due to acquisitions, mergers, closures, etc. - - all major stakeholders in this effort, i.e., EPA, state, drinking water systems, states-related organizations, and environmental groups agreed that these numbers should be considered estimates and that EPA should count the number of certifications of completion of emergency response plans submitted to the Agency. Each state serves as the final arbiter of issues related to system size. As each system submits this document, its name is checked. Any system on the list that has not submitted its certification of emergency response plan completion by the statutory deadline set forth in the Bioterrorism Act is contacted and a determination is made at that time if the system is still in operation and when it will submit the required material.

QA/QC Procedures: Other than what is described above, there is no QA/QC procedure for this activity and performance measure.

Data Quality Review: EPA works with the states on a regular basis to identify the drinking water systems in that state and to assure that these systems are reporting data to SDWIS.

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: With a newly-developed information strategy developed by EPA in partnership with the states and major stakeholders, several improvements to SDWIS are underway.

References: N/A

FY 2005 Performance Measure: The quality of water and sediments will be improved to allow increased consumption of fish in not less than 3% of the water miles/acres identified by states or tribes as having a fish consumption advisory in 2002.

Performance Database: National Listing of Fish and Wildlife Advisories.¹ The database includes fields identifying the waters for which fish consumption advisories have been issued. The fields also identify the date upon which the advisory was issued, thus allowing an assessment of trends. The National Hydrographic Data (NHD) are used to calculate the spatial extent of the fish advisory. This information is updated continually as states and tribes issue or revise advisories. The National Listing of Fish and Wildlife Advisories database includes records showing that 485,205 river miles and 11,277,276 lake acres were identified by states or tribes in calendar year 2002 (calendar year 2003 data will be available in May 2004) as having fish with chemical contamination levels resulting in an advisory of potential human health risk from consumption. States and tribes report data on a calendar year basis. The calendar year data are then used to support the fiscal year commitments (e.g. calendar year 2002 data support the FY 2003 commitments). Metadata are also available describing methodologies used by states and tribes for establishing advisories.

Data Source: State and Tribal Governments. These entities collect the information and enter it directly into the National Listing of Fish and Wildlife Advisories database. EPA reviews advisory entries, including the states' or tribes' responses to an on-line survey, which support the advisory decision. The Agency follows-up with the state or local government to obtain additional information where it is incomplete.

Methods, Assumptions and Suitability: The database comprises advisories that reporting states and tribes have in effect each year. The advisories are specific to a waterbody, and thus are not aggregated. The percentage of lake acres and river miles assessed is the ratio of the surface area of lakes and/or rivers for which states submit data to the National Listing of Fish & Wildlife Advisories database and the total water surface area in the United States. It is a simple mathematical calculation. The database reflects the actual number of advisories that states and tribes issued, and are thus specific to the performance measure.

QA/QC Procedures: A standard survey, which has been approved by OMB, is available on the Internet for electronic submission. A password is issued to ensure the appropriate party is completing the survey. EPA has national guidance^{2,3} for states and tribes on developing and implementing quality assurance practices for the collection of environmental information related to fish advisories. This guidance helps assure data quality of the information that states and tribes use to decide whether to issue an advisory. The Office of Water's "Quality Management Plan," approved in September 2001 and published in July 2002⁴, is the guidance that applies to this information collection.

Data Quality Reviews: EPA reviews advisory entries and responses to the survey to ensure the information is complete, then follows-up with the state or local government to obtain additional information where needed. However, the Agency cannot verify the accuracy of the voluntary information that state and local governments provide. There have been no external party reviews of this information.

Data Limitations: Participation in this survey and collection of data is voluntary. While the voluntary response rate has been high, it does not capture the complete universe of advisories. Two states, Puerto Rico, the Virgin Islands, and Guam do not report in the survey. In addition, states have not assessed all waters for the need for advisories, so the information reported reflects a subset of waterbodies in the state.

Error Estimate: Because submitting data to the National Listing of Fish & Wildlife Advisories database is voluntary, the Agency cannot be certain that the database contains information on 100% of the assessed waters in

the United States. Therefore, we may be understating the total amount of waters assessed, the magnitude of which is not known. The error value cannot be quantified.

New/Improved Data or Systems: EPA will use grants to encourage states to investigate more waters for the need for advisories. This will increase the number of waterbodies assessed, and lead to a more complete characterization of the nation's fish safety.

References:

1. U.S. EPA. Office of Water. "National Listing of Fish and Wildlife Advisories." Washington, DC: EPA Accessed May 1, 2003. Available only on the internet at <http://map1.epa.gov/>
2. U.S. EPA. Office of Water. "Fish Sampling and Analysis." Volume 1 of "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. 3rd ed. EPA-823-B-00-007. Washington DC: EPA, 2000. Available at <http://www.epa.gov/waterscience/fishadvice/volume1/>.
3. U.S. EPA. Office of Water. "Risk Assessment and Fish Consumption Limits." Volume 2 of "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories. 3rd ed. EPA-823-B-00-008. Washington DC: EPA, 2000. <http://www.epa.gov/waterscience/fishadvice/volume2/>.
4. U.S. EPA. Office of Water. "Quality Management Plan." EPA 821-X-02-001. Washington, DC: EPA, July 2002. Available at http://www.epa.gov/ow/programs/qmp_july2/.

FY 2005 Performance Measure: Percentage of the shellfish-growing acres monitored by states that will be approved for use.

Performance Database: The Shellfish Information Management System (SIMS). The database is being developed and implemented by the National Oceanographic and Atmospheric Administration (NOAA) on behalf of the Interstate Shellfish Sanitation Conference (ISSC), a Cooperative Program chartered by the Food and Drug Administration (FDA). The database will include relevant information that is collected by State Shellfish Control Authorities. Historically, NOAA collected shellfish-growing area data in 5-year intervals, 1985, 1990, and 1995. These data were not stored in a database. Once operational, SIMS will be the first national shellfish growing area database and will include NOAA's 1995 data and new data, available in September, 2003. State summary information can then be used to track trends relevant to the performance measure, with the 1995 data as baseline. The SIMS database is designed as a real time database. The ISSC plans to request data updates annually, but states may update their data any time. These data may be accessed at any time so timely status reports can be generated.

Data Source: EPA is a member of the ISSC SIMS steering committee, along with FDA and NOAA. The SIMS architecture is compatible with other databases using the National Hydrographic Dataset (NHD). The steering committee is confident that the procedures used to collect, analyze, and report the data will result in accurate and reliable data.

Methods, Assumptions and Suitability: SIMS is a real time database and, therefore, will provide up-to-date information.

QA/QC Procedures: States will be responsible for the internal QA/QC of their data. SIMS is designed to use state data to produce nationwide reports.

Data Quality Reviews: The ISSC is developing its SIMS processes to review data submitted by states.

Data Limitations: Based on NOAA's previous surveys and the voluntary nature of the effort, potential data limitations may include incomplete coverage of shellfish growing areas.

Error Estimate: No estimates are available.

New/Improved Data or Systems: SIMS, initiated in September 2003, will be evaluated on a periodic basis to identify and implement improvements.

References: None at this time.

FY 2005 Performance Measure: Restore water quality to allow swimming in stream miles and lake acres identified by states in 2000 as having water quality unsafe for recreation.

[The data narrative for this measure is under Goal 2, Objective 2 -- FY 2005 Performance Measure: Water quality standards are fully attained in miles/acres of waters identified in 2000 as not attaining standards.]

FY 2005 Performance Measure: Percentage of days of the beach season that coastal and Great Lakes beaches monitored by State beach safety programs will be open and safe for swimming.

Performance Database: The data are stored in PRAWN (Program tracking, beach Advisories, Water quality standards, and Nutrients)¹, an new internal database that feeds into the National Health Protection Survey of Beaches Information Management System.² The database includes fields identifying the beaches for which monitoring and notification information are available and the date upon which the advisory or closure was issued, thus enabling trend assessments to be made. Beginning in FY 2003, the database will identify those states that have received a BEACH (Beaches Environmental Assessment and Coastal Health) Act [P.L. 106-284] grant. EPA reports the information annually, on a calendar year basis, each May.

Data Source: Since 1997, EPA has surveyed state and local governments for information on their monitoring programs and on their advisories or closures. State and local governmental response to the survey is voluntary. The number of records on beaches has grown from 1,021 beaches in calendar year 1997 to 2,823 beaches in calendar year 2002. States and local entities collect and report data on a calendar year basis. The calendar year data are then used to support fiscal year commitments (e.g. 2002 calendar year data are used to support the FY 2003 commitments). Starting in calendar year 2003, data for beaches along the coast and Great Lakes must be reported to EPA as a condition of grants awarded under the BEACH Act³. EPA reviews the advisory entries and responses to the survey to ensure the information is complete, then follows-up with the state or local government to obtain additional information where needed.

Methods, Assumptions and Suitability: The data are a census of beach-specific advisories or closures issued by the reporting state or local governments during the year. Performance against the target is tracked using a simple count of the number of beaches responding to the survey and the advisory or closure actions taken. Thus the data are suitable for the performance measure.

QA/QC Procedures: Since 1997, EPA has distributed a standard survey form, approved by OMB, to coastal and Great Lake state and county environmental and public health beach program officials in hard copy by mail. The form is also available on the Internet for electronic submission. In calendar year 2002, voluntary survey responses included 30 percent from counties, 32 percent from cities, 20 percent from states, 10 percent from regional or districts, and 2 percent from federal entities. When a state or local official enters data over the Internet, a password is issued to ensure the appropriate party is completing the survey. EPA reviews the survey responses to ensure the information is complete, then follows up with the state or local government to obtain additional information where needed. Currently the Agency has procedures for information collection (see Office of Water's "Quality Management Plan," approved September 2001 and published July 2002⁴). However, because state and local officials submitted the data voluntarily, the Agency cannot verify the accuracy of the information provided. Starting in 2003, coastal and Great Lakes states receiving a BEACH Act grant are subject to the Agency's grant regulations under 40 CFR 31.45. These regulations require states and tribes to develop and implement quality assurance practices for the collection of environmental information.

Data Quality Review: EPA reviews the survey responses to ensure the information is complete, following up with the state or local government to obtain additional information where needed. The Agency cannot verify the accuracy of the voluntary information state and local governments provide. There have been no external party reviews of this information.

Data Limitations: From calendar year 1997 to calendar year 2002, participation in the survey and submission of data has been voluntary. While the voluntary response rate has been high, it has not captured the complete universe of beaches. The voluntary response rate was 92% in calendar year 2002 (240 out of 261 contacted agencies responded). The number of beaches for which information was collected increased from 1,021 in calendar year 1997 to 2,823 in calendar year 2002. Starting in calendar year 2003 participation in the survey will become a mandatory condition for grants awarded under the BEACH Act program to coastal and Great Lakes states.

However, coastal and Great Lakes states and local governments are not required to apply for a grant. Those coastal and Great Lakes states receiving a BEACH Act grant and subject to the Agency's grant regulations under 40 CFR 31.45 are required to develop and implement quality assurance practices for the collection of environmental information, helping to assure data quality.

Error Estimate: Because submitting data has been voluntary, the database does not contain information on 100% of beaches in the United States. No error estimate is available for this data because the total number of beaches in the U.S. is unknown.

New/Improved Data or Systems: With the passage of the BEACH Act of 2000, the Agency is authorized to award grants to states to develop and implement monitoring and notification programs consistent with federal requirements. As the Agency awards these implementation grants, it will require standard program procedures, sampling and assessment methods, and data elements for reporting. To the extent that state governments apply for and receive these grants, the amount, quality, and consistency of available data will improve. In FY 2005, EPA expects the 35 coastal and Great Lakes states to apply for grants to implement monitoring and notification programs. The BEACH Act also requires the Agency to maintain a database of national coastal recreation water pollution occurrences. The Agency has fulfilled this requirement by creating a new PRAWN database that includes this information. EPA has also developed eBeaches⁵, a new Internet-based system for secure transmittal of beach advisory and water quality data into PRAWN. This system will make it easier for states to accurately transmit this information to EPA using the Internet.

References

1. U.S. EPA. Office of Waters. "Beach Notification Data User Guide." EPA-823-R-03-005. Washington, DC: EPA, January 2003. Available at <http://www.epa.gov/waterscience/beaches/grants/2003/>
2. U.S. EPA. Office of Water. "National Health Protection Survey of Beaches". Washington, DC: EPA. Accessed May 23, 2003. Available only on the internet at <http://www.epa.gov/waterscience/beaches/>
3. U.S. EPA. Office of Water. "National Beach Guidance and Required Performance Criteria for Grants." EPA-823-B-02-004. Washington DC: EPA, June 2002. Available at <http://www.epa.gov/waterscience/beaches/guidance/all>.
4. U.S. EPA. Office of Water. "Quality Management Plan." EPA 821-X-02-001. Washington, DC: EPA, July 2002. Available at http://www.epa.gov/ow/programs/qmp_july2002.
5. U. S. EPA. Office of Water. "eBeaches." Fact Sheet. EPA-823-F-03-009. Washington, DC, July 2003. Available at <http://www.epa.gov/waterscience/beaches/>

STATUTORY AUTHORITIES

Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH)
Clean Water Act (CWA)
Emergency Planning and Community Right to Know Act (EPCRA) section 313 (42 U.S.C. 1023)
EPCRA section 313 (42 U.S.C. 11023)
Federal Food, Drug and Cosmetic Act (FFDCA)
Federal Fungicide, Insecticide and Rodenticide Act (FIFRA)
Food Quality Protection Act (FQPA) of 1996
National Environmental Policy Act, Section 102
Pollution Prevention Act (42 U.S.C. 13101-13109)
PPA (42 U.S.C. 13101-13109)
Safe Drinking Water Act (SDWA)
Water Resources Development Act (WRDA)

OBJECTIVE: Protect Water Quality

Protect the quality of rivers, lakes, and streams on a watershed basis and protect coastal and ocean waters.

Resource Summary (Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Protect Water Quality	\$2,346,144.8	\$1,647,043.1	\$1,645,669.9	(\$1,373.2)
Environmental Program & Management	\$274,428.9	\$286,677.0	\$290,271.3	\$3,594.3
Science & Technology	\$3,541.2	\$0.0	\$0.0	\$0.0
Building and Facilities	\$1,932.9	\$1,887.0	\$2,025.1	\$138.2
Inspector General	\$12,836.2	\$10,579.2	\$10,623.5	\$44.3
State and Tribal Assistance Grants	\$2,053,405.6	\$1,347,900.0	\$1,342,750.0	(\$5,150.0)
Total Workyears	1,546.0	1,610.2	1,603.9	-6.3

Program Project (Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Categorical Grant: Wastewater Operator Training	\$0.0	\$0.0	\$1,500.0	\$1,500.0
Categorical Grant: Nonpoint Source (Sec. 319)	\$228,776.9	\$238,500.0	\$209,100.0	(\$29,400.0)
Categorical Grant: Water Quality Cooperative Agreements	\$18,155.7	\$19,000.0	\$19,750.0	\$750.0
Categorical Grant: Pollution Control (Sec. 106)	\$193,648.9	\$200,400.0	\$222,400.0	\$22,000.0
Infrastructure Assistance: Alaska Native Villages	\$41,810.6	\$40,000.0	\$40,000.0	\$0.0
Infrastructure Assistance: Clean Water SRF	\$1,386,537.4	\$850,000.0	\$850,000.0	\$0.0
Marine Pollution	\$7,070.0	\$12,049.9	\$12,296.0	\$246.1
Surface Water Protection	\$169,317.7	\$189,230.1	\$190,785.3	\$1,555.2
Congressionally Mandated Projects	\$208,639.3	\$0.0	\$0.0	\$0.0
International Capacity Building	\$1,214.1	\$431.7	\$372.0	(\$59.7)
Administrative Projects	\$90,974.2	\$97,431.4	\$99,466.6	\$2,035.1
TOTAL	\$2,346,144.8	\$1,647,043.1	\$1,645,669.9	(\$1,373.3)

ANNUAL PERFORMANCE GOALS AND MEASURES**Watershed Protection**

- In 2005 500 of the Nation's watersheds have water quality standards met in at least 80% of the assessed water segments.
- In 2005 Water quality standards are fully attained in over 25% of miles/acres of waters by 2012, with an interim milestone of restoring 2% of these waters - identified in 2000 as not attaining standards - by 2005.
- In 2004 By FY 2005, Water quality will improve on a watershed basis such that 625 of the Nation's 2,262 watersheds will have greater than 80 percent of assessed waters meeting all water quality standards, up from 500 watersheds in 1998.

Performance Measures:

Watersheds that have greater than 80% of assessed waters meeting all water quality standards.

Waterbodies (river miles and lake acres) identified in 2000 as not attaining Water quality standards, are fully attained.

**FY 2003
Actuals**

**FY 2004
Pres. Bud.
500 (FY 05)**

**FY 2005
Pres. Bud.
500**

8-digit HUCs

2

% Miles/Acres

Baseline: As of 2002 state reports 453 watersheds had met the criteria that greater than 80% of assessed waters met all water quality standards. For a watershed to be counted toward this goal, at least 25% of the segments in the watershed must be assessed within the past 4 years consistent with assessment guidelines developed pursuant to section 305(b) of the Clean Water Act. In 2002, 0% of the 255,408 miles/and 6,803,419 acres of waters identified on 1998/2000 lists of impaired waters developed by States and approved by EPA under section 303(d) of the Clean Water Act.

Dredged Material/Ocean Disposal

- In 2005 Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for: coastal wetlands loss by at least 0.1 point; contamination of sediments in coastal waters by at least 0.1 point; benthic quality by at least 0.1 point; & eutrophic condition by at least 0.1 point
- In 2005 Scores for overall aquatic system health of coastal waters nationally, and in each coastal region, is improved on the "good/fair/poor" scale of the National Coastal Condition Report by at least 0.1 point

Performance Measures:

Score for overall aquatic system health of coastal waters nationally, and in each coastal region, is improved (cumulative).

Maintain water clarity and dissolved oxygen in coastal waters at the national levels reported in the 2002 National Coastal Condition Report

Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for coastal wetlands loss

Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for contamination of sediments in coastal waters

Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for benthic quality

Improve ratings reported on the national "good/fair/poor" scale of the National Coastal Condition Report for eutrophic condition

**FY 2003
Actuals**

**FY 2004
Pres. Bud.**

**FY 2005
Pres. Bud.**
2.5

Scale score

4.3 / 4.5

Scale score

1.5

Scale score

1.4

Scale score

1.5

Scale score

1.8

Scale score

Baseline: National rating of "fair/poor" or 2.4 where the rating is based on a 5-point system where 1 is poor and 5 is good and is expressed as an aerially weighted mean of regional scores using the National Coastal Condition Report indicators [i.e., water clarity, dissolved oxygen, coastal wetlands loss, eutrophic conditions, sediment contamination, benthic health, and fish tissue contamination]. The 2002 National Coastal Condition Report indicated 4.3 for water clarity and 4.5 for dissolved oxygen, 1.4 for coastal wetlands loss; 1.3 for contamination of sediments in coastal waters; 1.4 for benthic quality; & 1.7 for eutrophic condition.

State/Tribal Water Quality Standards

In 2005 In coordination with other federal partners reduce, by 11%, households on tribal lands lacking access to basic sanitation.

In 2005 Water quality in Indian country will be improved at not less than 35 monitoring stations in tribal waters for which baseline data are available (i.e., show at least a 10% improvement for each of four key parameters: total nitrogen, total phosphorus, dissolved oxygen, and fecal coliforms.)

In 2004 Assure that States and Tribes have effective, up-to-date water quality standards programs adopted in accordance with the Water Quality Standards regulation and the Water Quality Standards program priorities.

Performance Measures:	FY 2003 Actuals	FY 2004 Pres. Bud. 20	FY 2005 Pres. Bud.	
States with new or revised water quality standards that EPA has reviewed and approved or disapproved and promulgated federal replacement standards.				States
Tribes with water quality standards adopted and approved (cumulative).		33		Tribes
Number of monitoring stations (for which baseline data on 4 key parameters are available) where water quality is improved.			35	Stations
Number of households on tribal lands lacking access to basic sanitation.			11	% Households

Baseline: The performance measure of state submissions (above) thus represents a "rolling annual total" of updated standards acted upon by EPA, and so are neither cumulative nor strictly incremental. EPA must review and approve or disapprove state revisions to water quality standards within 60-90 days after receiving the state's package. In 2002, there will be four key parameters available at 900 sampling stations in Indian country. In 2002, Indian Health Service indicates that 71,000 households on Tribal lands lack access to basic sanitation.

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Watersheds in which at least 80% of the assessed water segments meet water quality standards.

Performance Database: The Watershed Assessment Tracking Environmental Results System (WATERS) (1) is used to summarize water quality information at the watershed level. For purposes of this national summary, "watersheds" are equivalent to 8-digit hydrologic unit codes (HUCs), of which there are 2,262 nationwide. WATERS is a geographic information system that integrates many existing data management tools including the STORage and RETrieval (STORET) database (2), the Assessment Database (3) and the Water Quality Standards database (4). Water quality information available through WATERS includes data submitted by the states under Clean Water Act (CWA) Section 305(b). These data are submitted to EPA every two years, with annual electronic updates. The U.S.EPA summarizes these data in the *National Water Quality Inventory Report*. (5)

Data Source: State CWA Section 305(b) reporting. The data used by the states to assess water quality and prepare CWA Section 305(b) reports come from multiple sources (state monitoring networks, United States Geological Survey (USGS), local governments, volunteer monitors, academic institutions, etc.) as well as predictive tools such as water quality models. Raw data may be entered by states and other sources into STORET. States compare available ambient monitoring data to their water quality standards to arrive at assessment results. Assessment results are then entered into the Assessment Database. EPA uses the assessment results to present a snap-shot of water quality as reported by the states (the *National Water Quality Inventory Report*), but because state methods and water quality standards vary widely, does not use the assessment results to report trends in water quality.

Information on each state's assessment methodology can be obtained from its 305(b) report, and raw data entered into STORET must meet metadata standards.

Methods, Assumptions and Suitability: States employ various methods of ambient water data collection, including: 1) Direct sampling of chemical, physical, and biological parameters using targeted site selection (usually, where problems are most likely or where water is heavily used); 2) Predictive models of water quality standards attainment; 3) Direct sampling at statistically-valid, probability-based sampling networks (in its early stages in a number of states); 4) Compilation of data from outside sources such as volunteer monitors, academic institutions,

and others. EPA-supported models include BASINS, QUAL2E, AQUATOX, and CORMIX. Descriptions of these models and instructions for their use can be found at www.epa.gov/OST/wqm/.

The standard operating procedures and deviations from these methods for data sampling and prediction processes are stored by states in the STORET database. EPA aggregates state assessment information by watershed (as described above) to generate the national performance measure. State assessment results describe attainment of designated uses in accordance with state water quality standards and thus represent a direct measure of performance. State CWA Section 305(b) data are suitable for providing a snapshot of the ambient water quality conditions that exist across the nation, in that subset of waters that are assessed. However, nationally aggregated data are currently not suitable for year-to-year comparisons. As states update their monitoring programs to include probabilistic monitoring, EPA will be able to conduct nationally aggregated, year-to-year comparisons.

QA/QC Procedures: QA/QC of data provided by states in their individual assessments (under CWA Section 305(b)) and accessed through WATERS is dependent on individual state procedures. Numerous system level checks are built into the data sources in WATERS, based upon the business rules associated with the water quality assessment database. States are given the opportunity to review the information to ensure it accurately reflects the data they submitted. Detailed data exchange guidance and training are also provided to the states. Sufficiency threshold for inclusion in this measure requires that 20% of stream miles in an 8-digit HUC be assessed. The Office of Water Quality Management Plan (QMP), renewed every five years, was approved in July 2002 (6). It describes the quality system used by the Office of Water and applies to all environmental programs within the Office of Water and to any activity within those programs that involves the collection or use of environmental data.

Data Quality Review: Numerous independent reports have cited that weaknesses in water quality monitoring and reporting undermine EPA's ability to depict the condition of the Nation's waters, to make trend assessments, and to support scientifically-sound water program decisions. The most recent reports include the 1998 *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program* (7), the March 15, 2000 General Accounting Office report *Water Quality: Key Decisions Limited by Inconsistent and Incomplete Data* (8), the 2001 National Academy of Sciences Report, *Assessing the TMDL Approach to Water Quality Management* (9), a 2002 National Academy of Public Administration Report, *Understanding What States Need to Protect Water Quality* (10), and EPA's *Draft Report on the Environment* (11). Water quality reporting under Section 305(b) has been identified as an Agency-Level weakness under the Federal Managers Financial Integrity Act.

In response to these evaluations, EPA has been working with states and other stakeholders to improve: 1) data coverage, so that state reports reflect the condition of all waters of the state; 2) data consistency, to facilitate comparison and aggregation of state data to the national level; and 3) documentation, so that data limitations and discrepancies are fully understood by data users.

The Office of Water has issued several recent guidance documents designed to increase consistency and coverage in state monitoring, assessment and reporting. In November 2001, EPA issued its Integrated Reporting guidance (12) which calls on states to integrate the development and submission of 305(b) water quality reports and Section 303(d) lists of impaired waters. The Integrated Report will enhance the ability of water quality managers to display, access, and integrate environmental data and information from all components of the water quality program. In July 2002, EPA released the *Consolidated Assessment and Listing Methodology - a Compendium of Best Practices* (13), intended to facilitate increased consistency in monitoring program design and in the data and decision criteria used to support water quality assessments. And in March 2003, EPA issued *Elements of a State Water Monitoring and Assessment Program* (14) which describes ten elements that each state water quality-monitoring program should contain and a ten-year time frame for implementing all elements. As part of each state's monitoring strategy, state data will be accompanied by quality assurance plans.

EPA has enhanced two existing data management tools (STORET and the Assessment Database) so that they include documentation of data quality information. EPA's WATERS tool integrates many databases including STORET, the Assessment Database, and the Water Quality Standards Database. These integrated databases facilitate comparison and understanding of differences among state standards, monitoring activities, and assessment results.

Data Limitations: Data are not representative of comprehensive national water quality assessments because most states do not yet employ a monitoring design that characterizes all waters in each reporting cycle. States, territories, and tribes collect data and information on only a portion of their water bodies because it is prohibitively expensive to monitor all water bodies. Furthermore, states do not use a consistent suite of water quality indicators to assess attainment with water quality standards. For example, indicators of aquatic life use support range from biological community condition to levels of dissolved oxygen to concentrations of toxic pollutants. State water quality standards themselves vary from state to state. State assessments of water quality may include uncertainties associated with derived or modeled data. These variations in state practices and standards limit how the assessment reports they provide can be used to describe water quality at the national level and prevent the agency from aggregating water quality assessments at the national level with known statistical confidence.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: The Office of Water is currently working with states, tribes and other Federal agencies to improve the database that supports this management measure by addressing the underlying methods of monitoring water quality and assessing the data. Also, the Office of Water is working with partners to enhance monitoring networks to achieve comprehensive coverage of all waters, use a consistent suite of core water quality indicators (supplemented with additional indicators for specific water quality questions), and document key data elements, decision criteria and assessment methodologies in electronic data systems. The Office of Water is using a variety of mechanisms to implement these improvements including data management systems, guidance, stakeholder meetings, training and technical assistance, program reviews and negotiations.

EPA is working with states to enhance their monitoring and assessment programs, with a particular emphasis on the probabilistic approach. These enhancements, along with improving the quality and timeliness of data for making watershed-based decisions, will greatly improve EPA's ability to use state assessments in consistently portraying national conditions and trends. Specific state refinements include developing rigorous biological criteria to measure the health of aquatic communities (and attainment with the aquatic life use) and designing probability-based monitoring designs to support statistically-valid inferences about water quality. The EPA Environmental Monitoring and Assessment Program (EMAP) design team has been instrumental in helping states design the monitoring networks and analyze the data. Initial efforts have focused on streams, lakes and coastal waters. Wetlands and large rivers will be targeted next. States are implementing these changes incrementally and in conjunction with traditional targeted monitoring. At last count, 16 states have adopted probability-based monitoring designs, several more are evaluating them, and all but 10 are collaborating in an EMAP study.

The Agency's FY2005 budget request includes a significant increase to support water quality monitoring improvements. A state grants component will support states' implementation of monitoring strategies, including refinement of biological assessment methods and probability-based designs for different water resource types, landscape models and other predictive tools, remote sensing and innovative indicators of water quality to help streamline where additional monitoring is needed, and targeted monitoring to provide data to implement local management actions such as National Pollution Discharge Elimination Program (NPDES) permits and Total Maximum Daily Loads (TMDLs). The initiative will also support improvement of data management systems to ensure that water quality monitoring data are understandable and available to all who need it. Included here are upgrades to STORET, to improve system navigation and operation and to enhance analysis and presentation applications. Funds will also support enhancing the capability to exchange water quality data with states.

References:

1. WATERS available on-line at www.epa.gov/waters. Aggregate national maps and state and watershed specific data for this measurement are displayed numerically and graphically in the WATERS database.
2. STORET available online at www.epa.gov/STORET. Links to user guide and descriptions of the database can be found here.
3. Assessment Database information available at <http://www.epa.gov/waters/305b/>
4. Water Quality Standards Database information available at www.epa.gov/wqsdatabase/
5. U.S. EPA, Office of Water. *National Water Quality Inventory, 2000 Report*. Washington, D.C.: August 2002. EPA 841-R-02-001. Available at www.epa.gov/305b/2000Report
6. U.S. EPA. *Office of Water Quality Management Plan*. Washington, DC: July 2002. EPA 831-X-02-001. Available at http://www.epa.gov/ow/programs/qmp_july2002.pdf

7. National Advisory Council for Environmental Policy and Technology. *Report of the Federal Advisory Committee on the Total Maximum Daily Load Program*. 1998. EPA 100-R-98-006. Available at <http://www.epa.gov/owow/tmdl/faca/tofc.htm>.
8. General Accounting Office. *Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data*. Washington, DC: March 15, 2000. GAO/RCED-00- 54.
9. National Research Council, Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction. *Assessing the TMDL Approach to Water Quality Management*. National Academy Press, Washington, DC: 2001.
10. National Academy of Public Administration. *Understanding What States Need to Protect Water Quality*. Washington, D.C: December 2002. Academy Project No. 2001- 001. Available at www.napawash.org
11. U.S. EPA. *Draft Report on the Environment 2003*. July 2003. EPA 260-R-02-006. Available at <http://www.epa.gov/indicators/roe/index.htm>
12. U.S. EPA, Office of Water. "Integrated Water Quality Assessment and Report Guidance." November 19, 2001. Available at <http://www.epa.gov/owow/tmdl/2002wqma.html>
13. U.S. EPA, Office of Water. "Consolidated Assessment and Listing Methodology. Toward a Compendium of Best Practices." (First Edition). Washington, DC: July 31, 2002. Available at www.epa.gov/owow/monitoring/calm.html
14. U.S. EPA, Office of Water. *Elements of a State Water Monitoring and Assessment Program*. Washington, DC: March 2003. EPA 841-B-03-003. Available at: www.epa.gov/owow/monitoring

FY 2005 Performance Measure: Water quality standards are fully attained in miles/acres of waters identified in 2000 as not attaining standards.

Performance Database: The Watershed Assessment Tracking Environmental Results System (WATERS– found at <http://www.epa.gov/waters/>) is the overarching Agency tool that is used to store water quality information related to this measure. Within WATERS, resides a section entitled “303(d) Information,” compiled from the comprehensive data set we refer to as *States’ Listings of Impaired Waters as Required by Clean Water Act Section 303(d)* (referred to here in brief as “303(d) lists”). This tool (found at <http://www.epa.gov/owow/tmdl/status.html>) is used to generate reports that identify individual impaired waters as well as an aggregation of impaired waters that is the total impaired river-miles and lake-acres. This information, combined with information and comment from EPA Regions and states, yields the baseline data for this measure– river-miles and lake-acres of impaired waters in 2000. As Total Maximum Daily Loads (TMDL) are developed, updated and entered into the National TMDL Tracking System (NTTS), and water bodies are no longer counted as impaired, the associated restored river-miles and lake-acres are removed from the year 2000 impaired totals. Changes will be recorded in reports, scheduled every 6 years (e.g. future reporting years 2006 and 2012), as percentage improvements to water body impairment.

Data Source: The underlying data source for this measure is State 303(d) lists of their impaired water bodies. Each state is required to submit this list to EPA every two years. States prepare the lists using actual water quality monitoring data, probability-based monitoring information, and other information and knowledge the state has, in order to make comprehensive determinations addressing the total extent of the state’s water body impairments. Once EPA approves a state’s 303(d) list, EPA enters the information into WATERS, as described above.

Methods, Assumptions, and Suitability: States employ various analytical methods of data collection, compilation, and reporting including: 1) Direct water samples of chemical, physical, and biological parameters; 2) Predictive models of water quality standards attainment; 3) Probabilistic models of pollutant sources; and 4) Compilation of data from volunteer groups, academic interests and others. EPA supported models include BASINS, QUAL2E, AQUATOX, and CORMIX. Descriptions of these models and instructions for their use can be found at www.epa.gov/OST/wqm/. The standard operating procedures and deviations from these methods for data sampling and prediction processes are stored by states in the STORET database. EPA aggregates state data by watershed (as described above) to generate the national performance measure. State provided data describe attainment of designated uses in accordance with state water quality standards and thus represent a direct measure of performance. State CWA Section 305(b) data are suitable for providing a snapshot of the ambient water quality conditions that exist across the nation; however, nationally aggregated ambient water quality data are currently not suitable for year-to-year comparisons. As states update their monitoring programs to include probabilistic monitoring, we will be able to do nationally aggregated, year-to year comparisons.

QA/QC Procedures: QA/QC of data provided by states pursuant to individual state 303(d) lists (under CWA Section 303(d)) is dependent on individual state procedures. EPA Regional staff interact with the states during the process of approval of the lists and before the information is entered into the database to ensure the integrity of the data. The Office of Water Quality Management Plan (QMP), renewed every five years, was approved in July 2001. EPA requires that each organization prepare a document called a quality management plan (QMP) that: documents the organization's quality policy; describes its quality system; and identifies the environmental programs to which the quality system applies (e.g., those programs involved in the collection or use of environmental data).

Data Quality Review: Numerous independent reports have cited that weaknesses in monitoring and reporting of monitoring data undermine EPA's ability to depict the condition of the Nation's waters and to support scientifically-sound water program decisions. The most recent reports include the 1998 *Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program*²², the March 15, 2000 General Accounting Office report *Water Quality: Key Decisions Limited by Inconsistent and Incomplete Data*²³, the 2001 National Academy of Sciences Report *Assessing the TMDL Approach to Water Quality Management*²⁴ and EPA's *Draft Report on the Environment*.²⁵

In response to these evaluations, EPA has been working with states and other stakeholders to improve: 1) data coverage, so that state reports reflect the condition of all waters of the state; 2) data consistency to facilitate comparison and aggregation of state data to the national level; and 3) documentation so that data limitations and discrepancies are fully understood by data users.

First, EPA enhanced two existing data management tools (STORET and the Assessment Database) so that they include documentation of data quality information.

Second, EPA has developed a GIS tool called WATERS that integrates many databases including STORET, the Assessment database, and a new water quality standards database. These integrated databases facilitate comparison and understanding of differences among state standards, monitoring activities, and assessment results.

Third, EPA and states have developed a guidance document: Consolidated Assessment and Listing Methodology - a Compendium of Best Practices²⁶ (released on the Web July 31, 2002 at www.epa.gov/owow/monitoring/calm.html) intended to facilitate increased consistency in monitoring program design and the data and decision criteria used to support water quality assessments.

Fourth, the Office of Water (OW) and EPA's regional offices have developed the *Elements of a State Water Monitoring and Assessment Program*, (August 2002) which is currently under review by our state partners. This guidance describes ten elements that each state water quality-monitoring program should contain and proposes time-frames for implementing all ten elements.

Data Limitations: Data may not precisely represent the extent of impaired waters because states do not yet employ a monitoring design that monitors all waters in each 303(d) listing cycle. States also do not use a consistent suite of water quality indicators to assess attainment with water quality standards. For example, indicators of aquatic life use support range from biological community assessments to levels of dissolved oxygen to concentrations of toxic pollutants. These variations in state practices limit how the 303(d) lists provided by states can be used to describe water quality at the national level. States, territories and tribes collect data and information on only a portion of their water bodies. There are differences among their programs, sampling techniques, and standards.

²² *Report of the Federal Advisory Committee on the Total Maximum Daily Load Program*. 1998. National Advisory Council for Environmental Policy and Technology. EPA Number 100R98006. National Center for Environmental Publications]

²³ *Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data*. March 15, 2000. RCED-00-54 and *Water Quality: Inconsistent State Approaches Complicate Nation's Efforts to Identify Its Most Polluted Waters*. January 11, 2002

²⁴ *Assessing the TMDL Approach to Water Quality Management*. 2001. Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction, Water Science and Technology Board, National Research Council

²⁵ US EPA. *Draft Report on the Environment 2003*. July 2003. EPA 260-R-02-006. Available at <http://www.epa.gov/indicators/roe/index.htm>

²⁶ U.S. EPA. (July 31, 2002). Consolidated Assessment and Listing Methodology. Toward a Compendium of Best Practices. (First Edition). Washington, DC: Office of Wetlands, Oceans, and Watersheds. Available on the Internet: Monitoring and Assessing Water Quality www.epa.gov/owow/monitoring/calm.html

State assessments of water quality may include uncertainties associated with derived or modeled data. Differences in monitoring designs among and within states prevent the agency from aggregating water quality assessments at the national level with known statistical confidence. States, territories, and authorized tribes monitor to identify problems and typically lag times between data collection and reporting can vary by state.

Error Estimate: No error estimate is available for this data.

New/Improved Data Systems: The Office of Water has been working with states to improve the guidance under which 303(d) lists are prepared. EPA issued new listing Guidance on July 21, 2003 entitled *Guidance for 2004 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act* (Guidance). The Guidance may be found at: <http://www.epa.gov/owow/tmdl/tmdl0103/index.html>. The Guidance addresses a number of issues that states and EPA identified during the 2002 listing cycle. Among these issues are minimum data requirements and sample size requirements in making listing determinations, use of probability-based sampling in the state's monitoring program, improved year-to-year consistency in a choice of a geo-referencing scheme, and use of a consistent method of segmenting water bodies and denoting changes to the segmentation between listing cycles.

References: Cited in body of text above.

FY 2005 Performance Measure: Water quality in Indian country

Performance Database: National Water Information System (NWIS), the USGS water monitoring database will be used to report on this measure (<http://waterdata.usgs.gov/nwis/usa>). Although NWIS has not yet adopted the EPA Tribal Identifier Data Standard (see [http://oaspub.epa.gov/edr/epastd\\$.startup](http://oaspub.epa.gov/edr/epastd$.startup)), the AIEO Tribal Information Management System (<https://oasint.rtpnc.epa.gov/TIMS/>) (phone 202-564-0303 for password access) can extract records from NWIS on the basis of reservation boundaries, enabling both data systems to provide tribal water quality data for this performance measure. NWIS records monitoring dates, so time series analysis will be a key feature of the Indian country water quality performance measure.

Data Sources: NWIS merges of all USGS district offices, and consists primarily of data collected by USGS field staff, either on a regular basis or for special projects.

QA/QC Procedures: Quality assurance for the Indian country water quality performance measure depends on the quality of the USGS NWIS data system. Documentation for NWIS quality assurance may be found at: (<http://water.usgs.gov/pubs/ddc/wqn96cd/html/wqn/qasure/qasure.htm>).

Data Quality Reviews: Two quality reviews are envisioned. The first will be a comparison of the federal data, in aggregate, and the water quality data reported by the tribes in CWA §106 water quality assessment reports. The review will be conducted for five tribal reservations. The second is a comparison of Storage and Retrieval System (STORET) data, EPA's repository of water quality monitoring data reported by states, tribes, other grantees, and other federal agencies, and NWIS water quality data for similar tribal geographic areas; this review is dependant upon future increased STORET use by tribes. The results of these two data quality reviews will allow AIEO to estimate a range of variation for the data used in the water quality assessments.

Data Limitations: The data collected for the tribal water quality performance measure are limited by the accuracy of the reservation boundary files used by AIEO. The files, IND-3, are distributed by the Bureau of Indian Affairs Geographic Data Service Center, (Internet site disabled). There are minor variations between the files provided by BIA and other sources of tribal boundary files. In an analysis of selected reservation boundaries, AIEO has determined that there is an approximately a 5% variation between the files from the BIA IND-3 dataset, and the Census Tiger files of reservation boundaries (http://www.census.gov/geo/www/cob/bdy_files.html).

Error Estimate: AIEO estimates an approximately 5% error in the identification of water monitoring sites that fall inside reservation boundaries because of errors in tribal boundaries and latitude and longitude of monitoring sites, resulting in errors in the extraction of geographic records from NWIS. The overall error of the performance measure is expected to be the percent variation in the water quality data from different sources (STORET, water quality assessment reports from tribes, NWIS) compounded by the error introduced by inaccuracies in boundary files. AIEO expects a 5% or greater error in the analysis, depending on the magnitude of the variation of the data from the different sources used.

New/Improved Data or Systems: As NWIS adopts a tribal identifier code, AIEO will no longer have to rely on geographic extraction of data records and that source of error will be eliminated. To date, USGS has not announced plans to tribally index their water quality data systems.

A key improvement in EPA's ability to assess tribal water quality will be the enhancement of tribes' usage of STORET. Plans are in place to improve outreach and technical assistance to tribes and states to encourage greater use of the system, and to use STORET's capabilities to upload local information to the national data warehouse. This will facilitate determinations of water quality status and trends nationwide and in Indian country in particular. EPA will also work to incorporate into STORET the agency's new Tribal Identifier Data Standard to further facilitate assessing tribal water quality information.

References:

1. U.S. Environmental Protection Agency. STORET Database. <http://www.epa.gov/STORET/>.
2. U.S. Environmental Protection Agency. American Indian Environmental Office. TIMS Database <https://oasint.rtpnc.epa.gov/TIMS/>
3. U.S. Geological Survey. Water Resources Division. NWIS Database <http://waterdata.usgs.gov/nwis/usa>.
4. Bureau of Indian Affairs. (2000). IND-3 Indian Reservations. Geographic Data Service Center, Lakewood, CO. (internet site disabled).
5. U.S. Census Bureau. Geographic Division. 2000 Census Tiger Files of American Indian Areas http://www.census.gov/geo/www/cob/bdy_files.html

FY 2005 Performance Measure: In coordination with other federal partners, reduce the number of households on tribal lands lacking access to basic sanitation.

Performance Database: The American Indian Environmental Office (AIEO) has been in the forefront of working with multiple agencies on a federal interagency Tribal Enterprise Architecture. Much of the work falls under the auspices of OMB Circular A-16 on coordination of federal geographic data across federal agencies (OMB 2003). The Tribal Enterprise Architecture includes access to a wide variety of data and information from several agencies and numerous sources within those agencies. It also includes several AIEO and jointly- developed applications to determine environmental performance in Indian country for a variety of specific purposes, including strategic planning and annual reporting under the Government Performance and Results Act. The components of the Tribal Enterprise Architecture create a broad, multi-variant view of the environmental conditions and programs in Indian country. EPA will track the status of federal and other basic sanitation infrastructure projects being undertaken in Indian country.

Data Sources: AIEO Tribal Enterprise Architecture will be linked to the Indian Health Service (IHS) Sanitation Tracking and Reporting System (STARS) database, which will be used to measure tribal access to basic sanitation in real-time. IHS STARS database, Level 4 (unsafe water or sanitation) and Level 5 (unsafe water and sanitation) information will be analyzed.

While the information from the STARS database is reported in the aggregate to Congress on an annual basis, the real-time data allow EPA to link IHS codes with EPA tribal codes on a project- by-project basis. It is anticipated that a significant percentage of other federal activity, besides EPA and IHS,— which provides tribes access to basic sanitation is captured in the IHS STARS system. AIEO will make the appropriate interagency inquiries to verify that all data are captured.

QA/QC Procedures: All the data used in the Tribal Enterprise Architecture project have quality assurance and metadata documentation prepared by the originating agency. AIEO works to standardize data and use metadata standards as established by the Federal Geographic Data Committee.

Data Quality Reviews: A unique feature of the Tribal Enterprise Architecture is the direct incorporation of a data center for documentation of errors and correction of text in the various data systems. This system, called the TIMS Data Center, provides for the systematic review and submission of corrections for 1) numeric and factual data from the national data systems used, and 2) qualitative statements made in a textual context. In the case of corrections to national databases, AIEO monitors submissions, and forwards them to appropriate systems administrators who make decisions on changes based on their criteria

Data Limitations: AIEO uses new geographic data mining technologies to extract records based on the geographical coordinates of the data points. For example, if a regulated facility has latitude and longitude coordinates that place it in the boundaries of the Wind River Reservation, then it is assigned to the Arapaho and Shoshone Tribes of the Wind River Reservation. This technique is extremely powerful, because it “tribally enables” large numbers of information systems which were previously incapable of identifying tribes. This will be applied to all the EPA databases. There are limitations, however. When database records are not geographically identified with latitude and longitude, the technique does not work and the record is lost to the system. Likewise, the accuracy of the method depends on the accuracy of the reservation boundary files. EPA continues to request up-to-date and accurate coverage of reservation boundaries and land status designations from other agencies

Error Estimate: In an analysis of selected reservation boundaries, AIEO has determined that there is a 5% variation between the Bureau of Indian Affairs’ IND-3 reservation boundaries and those from the United States Census Bureau (e.g., U.S. Census Tiger file of reservation boundaries). Another source of error comes from records that are not sufficiently described geographically to be assigned to specific tribes. For some agencies, such as USGS, the geographic record is complete, so there are no errors from these sources. It is estimated that 20% of the regulated facilities in EPA regulatory databases are not geographically described, and thus will not be recognized by the AIEO methodology.

New/Improved Data or Systems: The technologies used by the Tribal Enterprise Architecture are all new and state-of-the art. Everything is delivered securely on the Internet with no need for special software or desktop data disks. The geographic interface is an ESRI product called ARC/IMS, which is a web-based application, with a fully functional GIS system that is fully scalable. In FY 2003, the entire system will be rendered in 3D. The Tribal Enterprise Architecture uses XML protocols to attach to and display information seamlessly and in real-time from cooperating agency data systems without ever having to download the data to an intermediate server.

References:

1. Office of Management and Budget (2003). Circular A-16 Revised. http://www.whitehouse.gov/omb/circulars/a016/a016_rev.html
2. U.S. Environmental Protection Agency (1998). Office of Water Indian Strategic Plan.
3. GAP Grant Tracking System. <http://gap.tetratech-ffx.com> (password available upon request)
4. Tribal Enterprise Architecture <http://everest.sdc-moses.com/TRIBAL/index3.html> (password available upon request)
5. Indian Health Service. Sanitation Tracking and Reporting System. <http://wstars.geonorth.com> (password available upon request)
6. TIMS Data Center. <http://it-tetratech-ffx.com/tribal/> (password available upon request)
7. U.S. Environmental Protection Agency. 2003. Implementing EPA’s Information Quality Guidelines: Guidance on Information Products Developed by the Office of the Chief Financial Officer.

FY 2005 Performance Measures: Prevent water pollution and protect aquatic systems so that overall aquatic system health of coastal waters nationally, and in each coastal region, is improved on the “good/fair/poor” scale of the National Coastal Condition Report.

Maintain water clarity and dissolved oxygen in coastal waters at the national levels reported in the 2002 National Coastal Condition Report.

Improve ratings reported on the national “good/fair/poor” scale of the National Coastal Condition Report for: coastal wetlands loss by at least .1 points; contamination of sediments in coastal waters by at least .1 points; benthic quality by at least .1 points; & eutrophic condition by at least .1 points

Performance Database: EMAP/NCA [Environmental Monitoring and Assessment Program/National Coastal Assessment] database (housed EPA/ORD/NHEERL/AED, Narragansett, RI)(Environmental Protection Agency/Office of Research and Development/National Health and Environmental Effects Research Laboratory/Gulf Ecology Division); pre-database information housed in ORD/NHEERL facility in Gulf Breeze, FL (Gulf Ecology Division) (pre-database refers to a temporary storage site for data where it is examined for QA purposes, has appropriate metadata attached to it and undergoes initial statistical analyses); data upon QA acceptance and metadata completion is transferred to EMAP/NCA database and is web available at www.epa.gov/emap/nca.

Data Source: Probabilistic surveys of ecological condition completed throughout the Mid- Atlantic and Gulf of Mexico by EPA's Office of Research and Development (ORD) in 1991-1994, in southern Florida in 1995, in the Southeast in 1995-1997, in the Mid-Atlantic in 1997-1998, in each coastal state in 2000-2004 (except Alaska and Hawaii), in Alaska in 2002 and 2004, in Hawaii in 2002 and 2004, and in Puerto Rico in 2000 and 2004, and in other island territories (Guam, American Samoa and U.S. Virgin Islands in 2004). Surveys collect condition information regarding water quality, sediment quality and biotic condition at 70-100 sites/region (e.g., mid-Atlantic) each year of collection prior to 1999 and at 35-150 sites in each state or territory/year (site number dependent upon state) after 1999. Additional sampling was completed in the National Estuary Programs, including all individual national estuaries. Additional NEP sampling included sufficient sites to increase total sites within NEP boundaries to 30 for a two-year period between 2000-2003.

This "third party" data is collected through a joint EPA-State cooperative agreement and the States follow a rigid sampling and collection protocol following intensive training by EPA personnel. Laboratory processing is completed at either a state laboratory or through a national EPA contract. Both entities are subject to the development of a QAPP (either the National Coastal QAPP or one of their developments based on this QAPP) and QA testing and auditing by EPA.

Methods, Assumptions and Suitability: The surveys are conducted using a probabilistic survey design comprised to permit extrapolation of results to the entire target population (in this case - all estuarine resources of the specific state). The design maximizes the spatial spread of the sites and locating each site based on a specific latitude-longitude combination. The survey utilizes an index sampling period (generally late summer) to maximize encountering water quality, sediment quality and biotic condition problems, if they exist. Based on the QAPP and the field collection manual, a site in a specific state is located by sampling vessel via Global Positioning System (GPS) and water quality is measured on board at multiple depths. Water samples are taken for chemistry; sediment samples are taken for chemistry, toxicity testing and benthic community assessment; and fish trawls are conducted to collect community fish data and provide selected fish (target species) for analysis of whole body and/or fillet contaminant concentrations. Samples are stored in accordance with field manual and shipped to the processing laboratory. Laboratories follow QA plans and complete analyses and provide electronic information to state or EPA. For data not directly provided to EPA from laboratories, state forward data to EPA. For data not provided directly to states, EPA forwards data to states. EPA analyzes data to assess regional condition and states analyze data to assess condition of state-specific waters. Results of analyses on a national and regional basis are reported as chapters in the National Coastal Condition Report series. The overall regional condition index is the mean of the rating scores of the indicators used in successive versions of the Coastal Condition Report (see last section). An improvement for one of the indicators by a full category unit over the eight year period will be necessary for the regional estimate to meet the performance measure goal (+0.2 over an eight year period).

Assumptions: (1) The underlying target population (estuarine resources of the United States) has been correctly identified; (2) GPS operation is successfully located; (3) QAPP and field collection manuals are followed; (4) all samples can be successfully collected; (5) all analyses are completed in accordance with QAPP; and (6) all combinations of data into indices are completed in a statistically rigorous manner.

Suitability: By design all data are suitable to be aggregated to the state and regional level to characterize water quality, sediment quality, and biotic condition. Samples represent "reasonable", site-specific point-in-time data (not primary intention of data use) and an excellent population representation of the entire resource (extrapolation to entire resource supportable). The intended use of the data is the characterization of populations and subpopulations of estuarine resources through time. The data meets this expectation and the sampling design, response design, analysis approach and reporting approach have been peer reviewed successfully multiple times. The data are suitable for individual year characterization of condition, comparison of condition across years, and assessment of long-term trends once sufficient data are collected (7-10 years). Data are suitable for use in National Coastal Condition calculations for the United States and its regions as necessary to provide performance measurement information.

QA/QC Procedures: The sampling collection and analysis of samples are controlled by a Quality Assurance Project Plan (QAPP) [EPA 2001] and the National Coastal Assessment Information Management Plan (IMP)[EPA 2001]. These plans are followed by all twenty-three coastal states and 5 island territories. Adherence to the plans are determined by field training (conducted by EPA ORD), field audits (conducted by EPA/ORD), round robin testing of chemistry laboratories (conducted by EPA/ORD), overall systems audits of state programs and national laboratory practices (conducted by EPA), sample splits (sent to reference laboratories), blind samples (using

reference materials) and overall information systems audits (conducted by EPA/ORD). All states are subject to audits at least once every two years these controls at least once every two years for audits, training in year 2000 and retraining sessions every two years, and batch sample processing (including QA samples in each batch) for laboratory analyses.

Data Quality Reviews: Data quality reviews have been completed in-house by EPA ORD at the regional and national level in 2000-2003 (National Coastal Assessment 2000-2003) and by the Office of Environmental Information (OEI) in 2003 (assessment completed in June, 2003 and written report not yet available; oral debriefing revealed no deficiencies). No deficiencies were found in the program. A national laboratory used in the program (University of Connecticut) for nutrient chemistry, sediment chemistry and fish tissue chemistry is being evaluated by the Inspector General's Office for inappropriate behavior and potential falsification of laboratory results in connection with other programs not related to NCA. A full investigation has not been completed by the IG and in the interim has not determined any wrongdoing by the personnel associated with NCA. Our program has conducted an internal audit assessment and investigation and could determine only one finding, which was an incorrect use of a chemical digestion method for inorganic chemistry samples (metals). This finding has been corrected and all samples "digested" incorrectly have been reanalyzed at no cost.

Data Limitations: Data limitations are few. Because the data are collected in a manner to permit calculation of uncertainty and designed to meet a specific Data Quality Objective (DQO) (<10% error in spatial calculation for each state estimate annually), the results at the regional level (appropriate for this performance measure) are within about 2- 4% of true values dependent upon the specific sample type. Other limitations as follows: (a) even though methodology errors are minimized by audits, in the first year of the NCA program (2000) some errors occurred resulting in loss of some data. These problems were corrected in 2001 and no problems have been observed since then. (b) In some instances, (<5%) of sample results, a QA finding is determined regarding the precision of a measurement (control mortality toxicity testing exceeds limit detection limit for a chemistry batch exceeds limit, etc.). In these cases, the data are "flagged" in the database so that users are aware of the potential limitations. (c) Because of the sampling/ analysis design, the loss of data at a small scale (~ 10%) does not result in a significant increase in uncertainty in the estimate of condition. Wholesale data losses of multiple indicators throughout the U.S. coastal states and territories would be necessary to invalidate the performance measure. (d) The only source of external variability in year-to-year climatic variation (drought vs. wet, etc.) and the only source of internal variation is modification of reporting indicators (e.g., new indices, not a change in sample indicators collected and analyzed). This internal reporting modification required a re-analysis of earlier information to permit direct comparison (e). There is generally a 2-3 year lag from the time of collection until reporting. Sample analysis generally takes 1 year and analysis takes 1 year. Report production and peer review generally take an additional year. (F) Data collections are completed annually; however, the EPA/ORD program for this collection will occur through 2004. After 2004, ORD will assist OW as requested to provide expertise but the conduct of the surveys after 2004 will no longer be supported (financially) by EPA ORD.

Error Estimate: The estimate of condition (upon which the performance measure is determined has an annual uncertainty rate of about 2-3% for national condition, about 5-7% for individual regional indicators (composite of all five states data into a regional estimate), and about 9-10% for individual state indicators.

New/Improved Data or Systems:

- (1) Changes have occurred in the data underlying the performance measure based on scientific review and development. A change in some reporting indicators has occurred in order to more accurately represent the intended ecological process or function. For example, a new eutrophication index was determined for the 2000 data. In order to compare this new index to the 1991-1994 data, the earlier data results must be recomputed using the new technique. This recalculation is possible because the underlying data collection procedures have not changed.
- (2) New national contract laboratories have been added every year based on competition. QA requirements are met by new facilities and rigorous testing at these facilities is completed before sample analysis is initiated. QA adherence and cross-laboratory sample analysis has minimized data variability resulting from new laboratories entering the program.

- (3) The only reason for the discontinuance of the National performance goal would be the elimination of the surveys after 2004.

In order to continue to utilize the 2001 National Coastal Condition report as the baseline for this performance measure, the original scores reported in 2001 have been re-calculated in the pending 2004 report using the index modifications described above (#1). These “new” results for the baseline (re-calculated scores) are reported in Appendix C of the pending report scheduled for release in fall 2004.

References:

1. Environmental Monitoring and Assessment Database (1990-1998) and National Coastal Assessment Database (2000- 2004) websites: www.epa.gov/emap and www.epa.gov/emap/nca (NCA data for 2000 is only data available at present)
2. National Coastal Assessment. 2000-2003. Various internal memoranda regarding results of QA audits. (Available through John Macauley, National QA Coordinator NCA, USEPA, ORD/NHEERL/GED, 1 Sabine Island, Gulf Breeze, FL 32561)
3. National Coastal Assessment. 2001. Quality Assurance Project Plan. EPA/620/R- 01/002.(Available through John Macauley above)
4. National Coastal Assessment. 2001. Information Management Plan. EPA/620/R-01/003 (Available through Stephen Hale, NCA IM Coordinator, ORD/NHEERL/AED, 27 Tarzwell Drive, Narragansett, RI)
5. U.S. Environmental Protection Agency. 2001. National Coastal Condition Report. EPA-620/R- 01/005.
6. U.S. Environmental Protection Agency. 2004. National Coastal Condition Report II. In review Assigned Report Number EPA-620/R-04/001 (expected release date - fall 2004).

STATUTORY AUTHORITIES

Annual Appropriations Acts
Certain Alaskan Cruise Ship Operations Act (PL 106-554)
Clean Vessel Act
Clean Water Act (CWA)
Coastal Zone Act Reauthorization Amendments of 1990
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
Marine Plastic Pollution, Research and Control Act (MPPRCA) of 1987
Marine Protection, Research and Sanctuaries Act (MPRSA)
National Environmental Policy Act, Section 102
National Invasive Species Act of 1996
North American Free Trade Agreement (NAFTA)
Ocean Dumping Ban Act of 1988
Organotin Antifouling Paint Control Act (OAPCA)
Pollution Prevention Act (PPA)
Resource Conservation and Recovery Act (RCRA)
Safe Drinking Water Act (SDWA)
Shore Protection Act of 1988
Toxic Substance Control Act (TSCA)
Water Resources Development Act (WRDA)
Wet Weather Water Quality Act of 2000

OBJECTIVE: Enhance Science and Research

Provide and apply a sound scientific foundation to EPA's goal of clean and safe water by conducting leading-edge research and developing a better understanding and characterization of the environmental outcomes under Goal 2.

Resource Summary (Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Enhance Science and Research	\$119,269.5	\$120,501.6	\$120,959.1	\$457.5
Environmental Program & Management	\$18,346.3	\$21,640.6	\$22,084.0	\$443.3
Science & Technology	\$97,900.4	\$95,708.8	\$95,527.1	(\$181.7)
Building and Facilities	\$2,481.7	\$2,508.8	\$2,702.6	\$193.8
Inspector General	\$540.9	\$643.3	\$645.4	\$2.1
Total Workyears	535.7	526.7	526.5	-0.1

Program Project (Dollars in Thousands)

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	FY 2005 Req. v. FY 2004 Pres Bud
Surface Water Protection	\$520.9	\$1,004.4	\$1,011.3	\$6.9
Congressionally Mandated Projects	\$4,328.9	\$0.0	\$0.0	\$0.0
Research: Drinking Water	\$43,253.7	\$46,053.4	\$46,118.1	\$64.7
Research: Water Quality	\$46,934.1	\$47,178.5	\$46,809.8	(\$368.7)
Administrative Projects	\$24,231.9	\$26,265.3	\$27,019.9	\$754.6
TOTAL	\$119,269.5	\$120,501.6	\$120,959.1	\$457.5

ANNUAL PERFORMANCE GOALS AND MEASURES**Research****Scientific Rationale for Surface Water Criteria**

In 2005 Provide methods for developing water quality criteria so that, by 2008, approaches and methods are available to States and Tribes for their use in developing and applying criteria for habitat alteration, nutrients, suspended and bedded sediments, pathogens and toxic chemicals that will support designated uses for aquatic ecosystems and increase the scientific basis for listing and delisting impaired water bodies under Section 303(d) of the Clean Water Act.

Performance Measures:

	FY 2003 Actuals	FY 2004 Pres. Bud.	FY 2005 Pres. Bud.	
Methods for developing water quality criteria based on population-level risks of multiple stressors to aquatic life and aquatic-dependent wildlife.			09/30/05	methods

Baseline: State, Tribal, and EPA programs that assess, maintain, and restore water quality are all dependent upon the ability to define water quality standards that, when met, are protective of the designated and desired use of streams, lakes, and estuaries. The scientific bases for such standards are water quality criteria that relate biological outcomes (e.g., fish populations, aquatic wildlife communities, threatened and endangered species) to measurable water quality parameters (e.g., nutrients, suspended and embedded sediments, chemical concentrations). Relatively recent and Congressionally-mandated studies by the National Research Council call for continued and more targeted scientific studies on water quality criteria that reflect observed environmental variations and that reflect the multiple influence of habitat alteration, regional and watershed conditions, and appropriate designated uses. Accordingly, EPA has modified its longstanding research on water quality criteria to address these issues. Scientific outputs from this research can be integrated into EPA technical guidance to the States and Tribes. Adoption and deployment of new criteria developed with the assistance of the new methods and approaches will improve the cost-effectiveness of TMDL's and related restoration efforts. Beginning in FY 2005, regular evaluations by independent and external panels will provide reviews of EPA research programs' relevance, quality, and successful performance to date, in accordance with OMB's Investment Criteria for Research and Development. Reviewers will also qualitatively determine whether EPA has been successful in meeting its annual and long-term commitments for research. Recommendations and results from these reviews will improve the design and management of EPA research programs and help to measure their progress under the Government Performance and Results Act (GPRA).

VERIFICATION AND VALIDATION OF PERFORMANCE MEASURES

FY 2005 Performance Measure: Methods for developing water quality criteria based on population-level risks of multiple stressors to aquatic life and aquatic-dependent wildlife.

Performance Database: Program output; no internal tracking system

Data Source: N/A

Methods, Assumptions and Suitability: N/A

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: N/A

STATUTORY AUTHORITIES

Clean Air Act (CAA)

Clean Vessel Act

Clean Water Act (CWA)

Coastal Wetlands Planning, Protection, and Restoration Act of 1990

Coastal Zone Act Reauthorization Amendments of 1990

Endangered Species Act

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

Marine Plastic Pollution, Research and Control Act (MPPRCA) of 1987

Marine Protection, Research and Sanctuaries Act (MPRSA)

National Invasive Species Act of 1996

North American Wetlands Conservation Act

Ocean Dumping Ban Act of 1988

Safe Drinking Water Act (SDWA)

Shore Protection Act of 1988

Toxic Substances Control Act (TSCA)

Water Resource Development Act (WRDA)